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DATA RECORD OF OCEANOGRAPHIC OBSERVATIONS AND EXPLORATORY FISHING

No. 1

海洋調査漁業試験要報

第 1 号

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THE FACULTY OF FISHERIES, HOKKAIDO UNIVERSITY
Hakodate, Hokkaido
May 1957

北海道大学水産学部
函館市港町
昭和32年5月

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Hydrographic Data Obtained Principally in the Bering Sea by Training Ship "Oshoro Maru" in the Summer of 1955
January 1956

Correction of Data Presented in "Hydrographic Data Obtained Principally in the Bering Sea by Training Ship 'Oshoro Maru' in the Summer of 1955" Published in January 1956
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DATA RECORD
OF
OCEANOGRAPHIC OBSERVATIONS AND
EXPLORATORY FISHING

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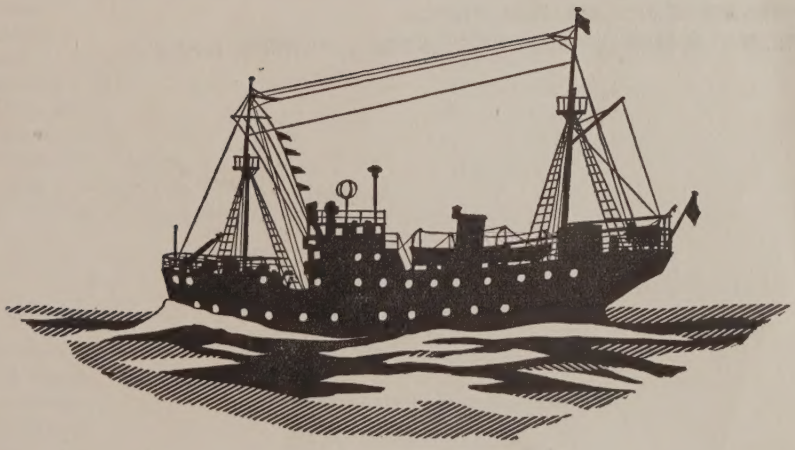
海洋調査漁業試験要報

第 1 号



THE FACULTY OF FISHERIES, HOKKAIDO UNIVERSITY
Hakodate, Hokkaido
May 1957

北海道大学水産学部
函館市港町
昭和32年5月

This publication is being undertaken for the sake of making available to interested persons, as soon as possible, some preliminary data derived from oceanographic, biological or exploratory-fishing researches carried out on the reguler or occasional cruises of the training ships of the Faculty of Fisheries, Hokkaido University.

In 1956 two reports were issued under the titles "Hydrographic data obtained principally in the Bering Sea by training ship, Oshoro Maru, in the summer of 1955" and "Correction of data presented in 'Hydrographic data obtained principally in the Bering Sea by training ship, Oshoro Maru, in the summer of 1955' published in January 1956" respectively, reporting the meteorological and hydrographical data of the 1955 cruise of the "Oshoro Maru" to the Bering Sea. Principal parts of these two reports are reprinted in the present "Data Record", No. 1, but certain parts of less importance are omitted.

It is requested that due credit be given in data from this "Data Record" are quoted, or if information taken herefrom is incorporated in other papers.

本学部練習船を用いて行われた海洋観測，生物調査，漁業試験の結果が，各研究担当者によつて研究論文として纏められ，印刷公表されるまでにはかなりの時日を要し，且研究論文には個々の測定値が表示されない場合が多いことを考慮し，練習船の調査航海毎に調査成果を本要報として逐次刊行し，各方面の参考に供することゝした。昭和30年度おしよろ丸ベーリング海観測結果は，昭和31年に特別出版として刊行したが，その中の最も重要な部分は本要報に再録しておいた。

本要報に載せた測定結果を他に引用する場合は本要報によつた旨明記しおかれ度い。

Fig. 1. Training Ship "Oshoro Maru"
練習船忍路丸

Built:	March 1909
Hull:	Wood
Rig:	Brigantine
Gross tonnage:	153 tons
Length:	35.51 metres
Breadth:	7.62 metres
Depth:	3.84 metres
Auxiliary engine:	Oil engine 50 H. P.
Fishing gear:	Drift gill-net, long-line, hand angling
Number of cemplement:	30 men
Decommissioned:	December 28, 1929

Fig. 2. Training Ship "Oshoro Maru II"
練習船おしよろ丸（二代）

Built:	May 9, 1927
Hull:	Steel
Rig:	Barquentine
Gross tonnage:	471.76 tons
Net tonnage:	219.69 tons
Length:	42.06 metres
Breadth:	9.14 metres
Depth:	4.72 metres
Auxiliary engine:	Diesel engine 500 H. P.
Fishing gear:	Trawl, drift gill-net
Canning machine	One line, semitroseamer
Refrigerating machine:	Ammonia type
Number of complement:	59 men

(Removed the sailing equipment, bowsprit and mainmast in March 1942)

Fig. 3. Training Ship "Oshoro Maru II" after Reconstruction
練習船おしよろ丸（二代）改造後

Reconstructed:	September 1952
Gross tonnage:	616.72 tons
Net tonnage:	213.52 tons
Displacement:	969.01 tons
Length:	46.79 metres
Breadth:	9.14 metres
Depth:	4.72 metres
Main engine:	Diesel engine 800 H. P.
Maximum speed:	11.3 knots
Cruising speed:	8.5 knots
Fuel capacity:	110 cubic metres
Fresh-water capacity:	126 cubic metres
Cruising range:	7200 miles
Fishing gear:	Trawl, long-line, drift gill-net
Canning machine:	One line, semitroseamer
Refrigerating machine:	Fleon type
Number of complement:	85 men

Fig. 4. Training Ship "Hokusei Maru"
練 習 船 北 星 丸

Commissioned (reconstructed from navy boat):	March 1949
Hull:	Wood
Gross tonnage:	104.21 tons
Net tonnage:	51.02 tons
Length:	27.02 metres
Breadth:	5.94 metres
Depth:	2.69 metres
Main engine:	Diesel engine 210 H. P.
Maximum speed:	9.7 knots
Cruising speed:	7.5 knots
Fuel capacity:	15.2 cubic metres
Fresh-water capacity:	6.0 cubic metres
Cruising range:	3400 miles
Fishing gear:	Medium trawl, drift gill-net, stick-held dip-net
Number of complement:	31 men
Decommissioned:	December 22, 1956

Fig. 5. Training Ship "Hokusei Maru II"
練 習 船 北 星 丸 (二代)

Built:	February 5, 1957
Hull:	Steel
Gross tonnage:	221.61 tons
Net tonnage:	95.37 tons
Displacement:	365 tons
Length:	37.00 metres
Breadth:	6.80 metres
Depth:	3.40 metres
Main engine:	Diesel engine 450 H. P.
Mximum speed:	11.0 knots
Cruising speed:	9.5 knots
Fuel capacity:	80.32 cubic metres
Fresh-water capacity:	27.84 cubic metres
Cruising range:	9000 miles
Fishing gear:	Drift gill-net, long line, stick-held dip-net
Refrigerating machine:	Fleon type
Number of complement:	43 men

Fig. 6. General Arrangement of "Hokusei Maru II"
北 星 丸 (二代) 一 般 配 置 図

Fig. 1. "Oshoro Maru"

Fig. 2. "Oshoro Maru II"

Fig. 3. "Oshoro Maru II" after reconstruction

Fig. 4. "Hokusei Maru"

Fig. 5. "Hokusei Maru II"

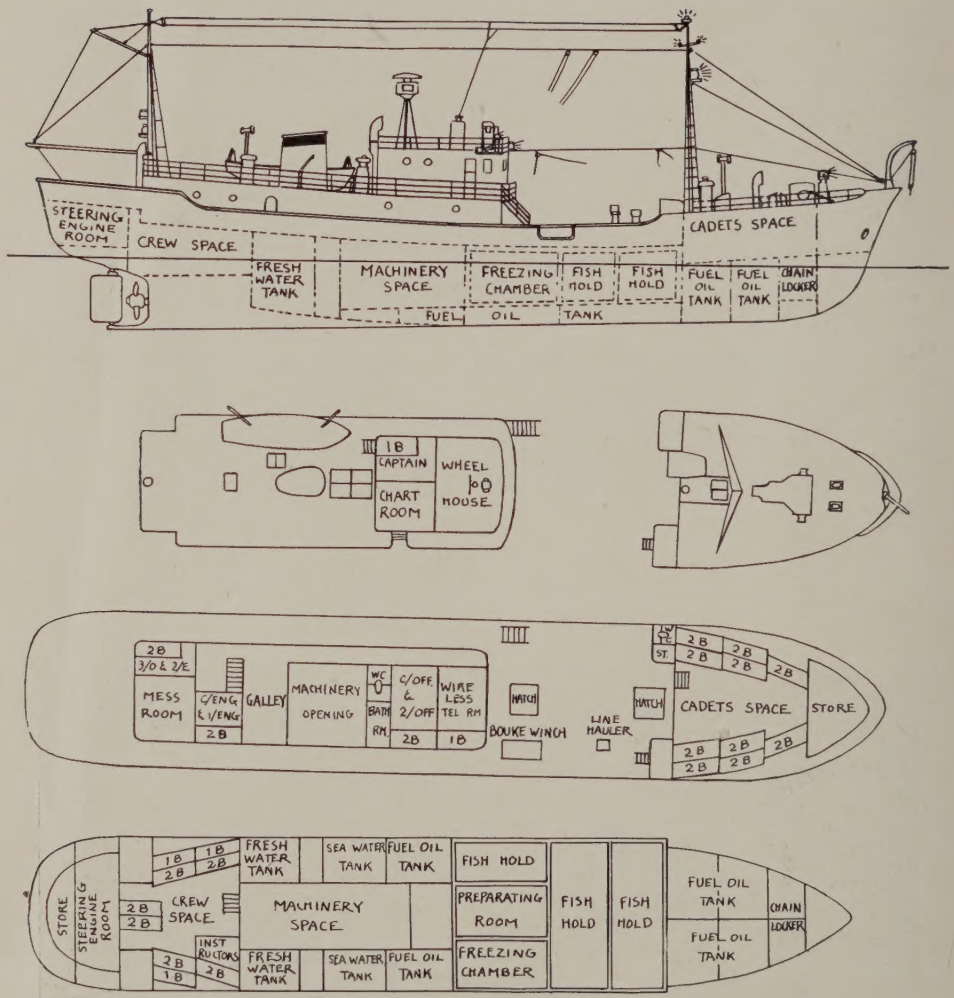


Fig. 6. General arrangement of "Hokusei Maru II"

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No. 1 May 1957

海洋調査漁業試験要報

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The Faculty of Fisheries, Hokkaido University
北海道大学水産学部

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I

1953 CRUISE OF THE "OSHORO MARU" TO ALEUTIAN WATERS

おしよろ丸　昭和28年度
アリューシャン海域航海

1. Cruise Report
（航海報告）

Departure from Hakodate	May 4 （函館出港）
First hydrographic cast	May 14 （海洋観測開始）
Passed Amchitka Pass	May 17 （アムチトカ海峡通過）
First salmon gill-net set	May 21 （鮭鱒流網開始）
Last hydrographic cast	June 6 （海洋観測終了）
Explosion of air tank in the galley; No. 1 Oiler S. Hori received serious wounds at 49°27′N, 159°45′E; ship directed to homeland.	June 18 （賄室エアータンク爆発し操機長堀正平重傷を負い，本船帰途に就く）
NO. 1 Oiler died at 47°17′N, 156°08′E	June 19 （操機長死亡）
Arrival at Hakodate	June 22 （函館帰港）
Covered 6146 miles in total 49 days at sea.	（総航程6146浬、航海日数49日）

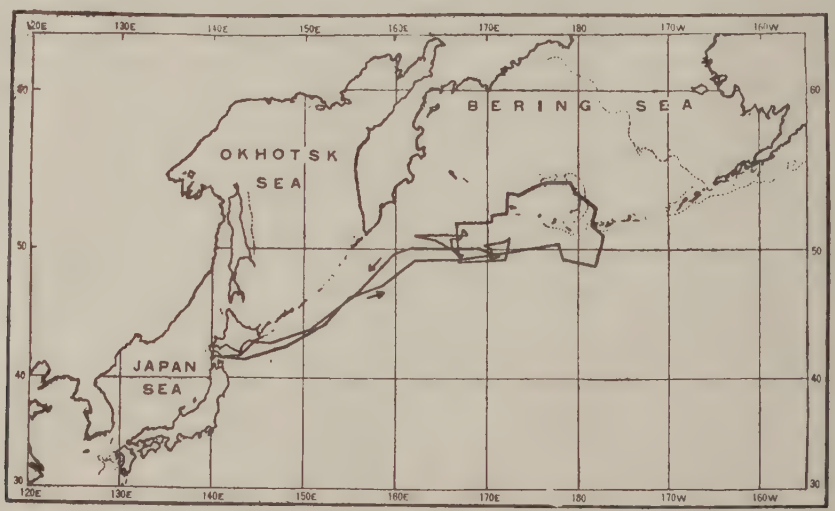

Fig. 7. Track of 1953 cruise of the "Oshoro Maru" to Aleutian waters

2. Members of Staff Aboard
（乗 船 者）

Captain	Seikichi Mishima	（船　長　三　島　清　吉）
Crew（乗組員）		
Chief Officer	Shigeo Abe	（一等航海士　阿　部　茂　夫）
Second Officer	Shōji Saitō	（二等航海士　斎　藤　昭　二）
Third Officer	Shōichi Yamamoto	（三等航海士　山　本　昭　一）
Junior Third Officer	Noriyoshi Masuda	（次席三等航海士　増　田　紀　義）
Chief Engineer	Shōichi Tomisawa	（機　関　長　富　沢　正　一）
First Engineer	Katsuzō Ban	（一等機関士　伴　　勝　三）

Second Engineer	Kenzō Omi	(二等機関士 尾見健三)
Third Engineer	Ichirō Kataoka	(三等機関士 片岡一郎)
Wireless Operator	Mitsuo Kurotori	(無線通信士 黒鳥満雄)
Purser	Akira Togashi	(事務長 富樫章)
Doctor	Teishi Nakayama	(船医 中山悌志)
and 23 men		

Research Men (調査員)

Research Assistant	Miki Oguro (Chemistry) (助手 小黒美樹, 化学)
Research Assistant	Satoshi Nishizawa (Oceanography) (助手 西沢敏, 海洋物理)
	Hiroshi Konno (Chemistry) (今野照, 化学)
Undergraduate Student	Noriaki Ogawa (Biology) (学生 小川法章, 生物)

Cadets (実習生)

18 cadets of Undergraduate Course of Pelagic Fishery (遠洋漁業科学生 18名)

Total 57 persons (総員 57名)

3. Specification of Hydrographic Stations
(海洋観測地点)

Fig 8. Hydrographic stations in 1953 cruise of the "Oshoro Maru"

Table 1. Hydrographic stations in 1953 cruise to Aleutian waters

No. of station	Ship's time		Greenwich mean time (Universal time)		Position		Maximum depth of cast (m)
	Date	Hour	Date	Hour	Latitude	Longitude	
Os 1	5~14	2000~0115	5~14	0900~1415	49°-22′ N	178°-18′ E	985
Os 2	5~15	1345~1615	5~15	0245~0515	48°-57′ N	178°-49′ W	1000
Os 3	5~15	2340~0200	5~15	1240~1500	50°-00′ N	178°-44′ W	966
Os 4	5~16	0835~1025	5~15	2135~2325	50°-58′ N	178°-40′ W	990
Os 5	5~17	0120~0300	5~16	1420~1600	52°-36′ N	178°-46′ W	985
Os 6	5~17	1320~1445	5~17	0220~0345	53°-22′ N	179°-27′ E	400
Os 7							
Os 8	5~18	0730~0830	5~17	2030~2130	54°-00′ N	178°-57′ E	750
Os 9							
Os 10	5~19	0930~1030	5~18	2230~2330	53°-50′ N	175°-24′ E	65
Os 11	5~19	1920~2050	5~19	0820~0950	53°-35′ N	173°-43′ E	883
Os 12	5~20	0520~0700	5~19	1820~2000	53°-42′ N	172°-09′ E	800
Os 13	5~20	1910~2100	5~20	0810~1000	52°-15′ N	172°-07′ E	839
Os 14	5~21	1730~1830	5~21	0630~0730	51°-53′ N	170°-23′ E	200
Os 15	5~24	1300~1410	5~24	0200~0310	49°-33′ N	167°-01′ E	750
Os 16	5~25	1600~1800	5~25	0500~0700	50°-09′ N	166°-14′ E	143
Os 17	5~27	1430~1600	5~27	0330~0500	51°-28′ N	166°-24′ E	866
Os 18	6~ 1	0800~1000	5~31	2100~2300	50°-55′ N	161°-23′ E	970
Os 19	6~ 2	2000~2200	6~ 2	0900~1100	49°-50′ N	166°-46′ E	600
Os 20	6~ 5	1300~1530	6~ 5	0200~0430	49°-24′ N	172°-00′ E	1000
Os 21	6~ 6	1200~1400	6~ 6	0100~0300	50°-51′ N	172°-00′ E	910

4. Items of Observations and Procedure at Sea
(調査項目及海上作業)

Hydrographic cast (海洋観測)

An electromotive hydrographic winch, 3 H.P. and a hand winch were used. 15 Nansen bottles, 15 protected reversing thermometers and an unprotected reversing thermometer were provided, but 3 Nansen bottles and 3 protected thermometers were lost during the work at sea. Each Nansen bottle carried a protected thermometer; deepest bottle was equipped with an unprotected thermometer together with a protected thermometer.

Plankton Sampling (プランクトン採集)

Vertical hauls were made with 35 cm X 130 cm conical net made of GG 40 bolting silk (39 meshes a linear inch) usually for 0–20 m, 20–50 m, 50–150 m, and 500–1000 m divided by means of iron cap (Motoda & Anraku, 1954. Bull. Fac. Fish., Hokkaidō Univ. Vol. 4, No. 5).

Salmon gill-net set (鮭鱒流網操業)

Specification of the net is:

Material of threads: Amiran

Size of mesh when strechted: 4.3 Sun (14.2 cm)

Number of meshes in horizontal direction: 600 meshes per 1 Tan (31.4 Ken) (47 m)

Number of meshes in vertical direction: 60 meshes per 4.1 Ken (6.2m)

Length of net constructed: 30 Tan (1410 m)

Depth of net constructed: 4.1 Ken (6.2 m)

Net was disconnected from the ship during the set, but watched on the ship by means of Radar which caught the reflection from the corner reflector placed on the buoy on the net (Ishida & Suzuki, 1954. Bull. Fac. Fish., Hokkaidō Univ. Vol. 5, No. 1).

Biological studies on salmon (鮭鱒の生物学的研究)

About 50 specimens were sampled from the catch of a net set. They were placed on the measurement of biological characters and sampling of scales.

5. Publications Issued up to the Present
(発表された報告，研究論文)

(1) Anraku, M. 1954. Gymnoplea Copepoda collected in Aleutian waters in 1953. Bull. Fac. Fish., Hokkaidō Univ. Vol. 5, No. 2, pp. 123–136.

(2) Mishima, S. and S. Nishizawa. 1955. Report on hydrographic investigations in Aleutian Waters and southern Bering Sea in the early summers of 1953 and 1954. Ibid. Vol. 6, No. 2, pp. 85–119.

(3) Motoda. S. and Y. Kawarada. 1955. Diatom communities in western Aleutian waters on the basis of net samples collected in May–June 1953. Ibid. Vol. 6, No. 3, pp. 191–200.

6. Data on Temperature and Salinity
(温度塩分記録)

Chlorinity titration, computation of depths and interpolation of data were made by S. Nishizawa.

Table 2. Temperature and salinity data in 1953 cruise to Aleutian waters

(Reprinted from "Mishima & Nishizawa, 1955. Bull. Fac. Fish., Hokkaidō Univ. Vol. 5, No. 2," but location of St. 14 is corrected, and some parts of data extrapolated are omitted).

Time=Ship's time

Station	1		2		3		4		5		6		8		10		11		12	
Lat. Long.	49. 22 N 178. 18 E		48. 57 N 178. 49 W		50. 00 N 178. 44 W		50. 58 N 178. 40 W		52. 36 N 178. 46 W		53. 22 N 170. 27 E		54. 00 N 178. 57 E		53. 50 N 175. 24 E		53. 35 N 173. 43 E		53. 42 N 172. 09 E	
Date	V — 14		V — 16		V — 15		V — 16		V — 17		V — 17		V — 18		V — 19		V — 19		V — 20	
Time	20.00— 1.15		13.45—16.15		23.40— 2.00		8.35—10.25		1.20— 3.00		13.20—14.45		7.30— 8.30		9.30—10.30		19.20—20.50		5.20— 7.00	
	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity
0	4.25	33.22	4.90	33.26	4.66	33.39	5.68	32.81	4.76	33.24	3.40	33.51	3.38	33.57	3.44	33.55	2.58	33.33	3.19	33.30
10	4.23	33.19	4.69	33.01	4.22	33.05	5.39	32.74	4.64	33.15	3.38	33.46	3.35	33.54	3.43	33.40	2.95	33.28	3.17	33.30
25	3.50	33.10	4.34	33.26	3.48	32.97	4.57	32.74	4.15	33.21	3.30	33.37	3.27	33.52	3.25	33.08	2.94	33.26	3.13	33.30
50	3.30		3.59	33.26	3.21	33.26	3.20	33.24	3.76	33.35	2.82		2.74	33.42	2.93	33.22	2.92	33.28	3.03	33.30
75	3.24	33.17	3.40	33.24	3.16	33.26	3.14	33.39	3.66	33.42	2.75	33.43	2.69				2.75	33.24	2.74	33.31
100	3.14	33.24	3.24	33.29	2.92	33.28	3.06	33.40	3.66	33.42	2.70	33.47	2.85	33.44			2.64	33.24	2.51	33.30
150	3.73	33.91	3.79	33.69	3.95	33.91	4.05	33.80	3.23	33.19	2.69	33.42	2.73	33.56			3.18	33.66	3.08	33.53
200	3.77	34.02	3.84	34.04	3.87	34.05	4.11	33.95	3.25	33.63	3.06	33.60	3.00	33.70			3.91	33.82	3.78	33.87
300	3.74	34.17	3.85	34.14	3.72	34.23	3.66	34.09	3.36	33.87	3.58	34.01	3.86	33.86			3.62	33.98	3.64	34.08
400	3.58	34.26	3.71	34.27	3.50	34.28	3.57	34.20	3.50	34.01	3.38	34.21	3.56	34.05			3.52	34.13	3.52	34.14
500	3.44	34.32	3.44	34.31	3.40	34.35	3.54	34.27	3.55	34.15			3.50	34.21			3.42	34.27	3.50	34.20
750	2.94	34.40	3.08	34.49	2.98	34.41	3.12	34.43	3.12	34.37			3.10	34.34			3.25	34.37		
1000			2.74	34.51																

Station	13		14		15		16		17		18		19		20		21	
Lat. Long.	52. 16 N 172. 07 E		51. 53 N 170. 23 E		49. 38 N 167. 01 E		50. 09 N 166. 14 E		51. 28 N 168. 24 E		50. 55 N 161. 28 E		49. 50 N 166. 46 E		49. 24 N 172. 00 E		50. 51 N 172. 00 E	
Date	V — 30		V — 21		V — 24		V — 25		V — 27		VI — 1		VI — 2		VI — 5		VI — 6	
Time	19.10—21.00		17.30—18.30		13.00—14.10		16.00—18.00		14.30—16.00		8.00—10.00		20.00—22.00		13.00—15.30		12.00—14.00	
	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity
0	3.20	33.55	4.30	33.31	3.60	33.30	4.35	33.15	4.28	33.30	2.96	33.42	3.50		3.56	33.31	3.90	33.30
10	3.13	33.30	3.59	33.26	3.59	33.28	3.58	33.30	4.27	33.30	2.95	33.35	3.48	33.37	3.36	33.22	3.72	33.08
25	3.01	33.30	3.49	33.26	3.42	33.31	3.01	33.28	3.78	33.26	2.85	33.21	3.45	33.31	3.28	33.21	3.84	33.24
50	3.10	33.30	3.29	33.28	2.13	32.83	2.10	33.30	2.79	33.23	0.75	33.26	1.66	33.33	3.20	33.35	3.45	33.28
75	2.60	33.26	2.92	33.21	1.46	33.30	1.98	33.22	2.57	33.26	0.38	33.21	1.26	33.30	3.15	33.21	3.46	33.26
100	2.56	33.34	2.82	33.30	1.50	33.06	1.92	33.26	2.33	33.28	0.01	33.35	1.06	33.36	2.30	33.15	2.76	33.26
150	2.28	33.88	2.94	33.48	3.13	33.77			2.55	33.72	2.88	33.89	1.60	33.50	2.18	33.42	3.62	33.40
200	3.31	33.90	3.82	33.87	3.30	34.02			3.23	33.96	3.34	34.04	3.44	33.90	3.01	33.89	3.80	33.70
300	3.13	34.15			3.35	34.19			3.38	34.21	3.43	34.16	3.41	34.17	3.49	34.13	3.94	33.83
400	3.46	34.24			3.29	34.28			3.45	34.25	3.34	34.27	3.30	34.24	3.46	34.20	3.94	33.93
500	3.51	34.31							3.45	34.34	3.13	34.31	3.13	34.29	3.30	34.28	3.73	34.13
750	3.05	34.45							2.78	34.46	2.76	34.44			2.94	34.40	3.11	34.29
1000															3.08	34.52		

7. Data on Dissolved Oxygen
(溶存酸素記録)

Measurement was made by M. Oguro aboard the ship.

Table 3. Data on oxygen in 1953 cruise to Aleutian waters

Station	Os 1		Os 2		Os 3		Os 4		Os 5		Os 6		Os 8		Os 10		Os 11		Os 12	
	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2	Depth	O_2
	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L
Observed	0	7.76	0	7.16	0	7.44	0	8.07	0	7.66	0	7.72	0	8.18	0	7.77	0	7.75	0	7.65
	10	7.48	10	7.50	10	7.46	10	8.16	10	6.48	30	7.77	19	7.88	10	7.50	10	7.64	10	7.77
	25	7.70	25	7.51	25	7.55	25	8.43	25	5.82	44	7.63	30	8.02	25	7.49	25	7.57	25	7.33
	50	7.61	49	7.58	50	7.51	50	7.07	50	6.74	69	7.54	50	7.56	50	7.40	49	8.11	50	7.63
	75	7.44	72	7.43	75	7.39	75	7.01	74	8.02	91	7.61	81	7.46	75	7.75	72	7.24	75	7.46
	100	7.38	99	7.44	100	7.21	100	6.54	99	7.60	123	7.33	100	7.22	100	5.24	97	7.44	100	7.40
	150	3.06	148	6.14	149	2.30	150	3.34	148	6.40	168	4.23	138	6.49			144	4.83	150	3.03
	197	2.13	197	2.82	193	1.69	200	2.64	197	5.82	240	4.05	306	2.91			191	3.45	200	1.97
	295	1.88	295	2.32	289	0.98	299	1.41	295	3.70	283	2.12	383	2.08			287	2.59	299	1.58
	394	1.71	394	1.99	386	0.90	398	1.15	394	2.79	355	1.49	460	1.40			373	1.48	363	1.53
	492	1.35	492	1.10	483	0.88	496	1.07	492	1.83	386	1.27	537	1.28			460	1.12	453	0.90
	739	1.31	700	1.04	720	1.38	741	1.41	739	1.19			728	1.47			662	1.39	607	1.03
	985	1.29	914	1.41	966	1.51	988	1.07	985	1.02							883	1.59		
Interpolated	0	7.76	0	7.16	0	7.44	0	8.07	0	7.66	0	7.72	0	8.18	0	7.77	0	7.75	0	7.65
	10	7.48	10	7.50	10	7.46	10	8.16	10	6.48	10	7.74	10	8.02	10	7.50	10	7.64	10	7.77
	25	7.70	25	7.51	25	7.55	25	8.43	25	5.82	25	7.77	25	7.89	25	7.49	25	7.57	25	7.33
	50	7.61	50	7.57	50	7.51	50	7.07	50	6.74	50	7.59	50	7.56	50	7.40	50	8.10	50	7.63
	75	7.44	75	7.41	75	7.39	75	7.01	75	8.01	75	7.56	75	7.41	75	7.75	75	7.25	75	7.46
	100	7.38	100	7.43	100	7.21	100	6.54	100	7.59	100	7.58	100	7.22	100	5.24	100	7.43	100	7.40
	150	3.06	150	5.93	150	2.25	150	3.34	150	6.36	150	4.95	150	6.25			150	4.50	150	3.03
	200	2.10	200	2.78	200	1.61	200	2.61	200	5.81	200	4.12	200	5.08			200	3.36	200	1.97
	300	1.87	300	2.30	300	0.97	300	1.40	300	3.68	300	1.96	300	3.02			300	2.45	300	1.57
	400	1.69	400	1.96	400	0.91	400	1.14	400	2.75	400	1.24	400	1.90			400	1.25	400	1.28
	500	1.34	500	1.07	500	0.92	500	1.07	500	1.80			500	1.30			500	1.16	500	0.93
	750	1.30	750	1.10	750	1.43	750	1.11	750	1.18			750	1.53			750	1.50	750	1.14
	1000	1.31	1000	1.60	1000	1.53	1000	1.09	1000	1.01										

(Continued)

Station	Os 13		Os 14		Os 15		Os 16		Os 17		Os 18		Os 19		Os 20		Os 21	
	De-pth	O_2	De-qth	O_2	De-pth	O_2	De-pth	O_2	De-pth	O_2	De-pth	O_2	De-pth	O_2	De-pth	O_2	De-pth	O_2
	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L	m	ml/L
Observed	0	7.67	0	7.55	0	7.78	0	7.50	0	7.73	0	7.67	0	7.53	0	7.53	0	7.75
	10	7.45	10	7.56	10	7.65	10	7.49	10	7.33	10	7.73	10	7.28	10	7.55	10	7.79
	25	7.49	25	7.49	24	8.04	24	7.34	25	7.50	25	7.69	25	7.43	25	7.53	25	7.76
	49	7.40	50	7.64	47	7.94	29	7.45	49	7.69	50	8.12	49	7.53	50	7.60	49	7.65
	73	7.21	75	8.14	69	7.80	38	7.41	74	7.47	75	7.83	72	7.56	75	7.53	74	7.69
	96	7.49	100	7.63	92	7.65	48	7.27	94	7.49	100	7.75	95	7.43	100	7.69	99	7.86
	123	2.98	150	6.00	136	4.23	71	7.29	145	4.11	150	2.48	142	6.85	150	6.35	148	4.70
	191	2.73	200	3.21	182	1.76			182	2.30	200	1.19	180	3.52	200	2.50	182	4.35
	246	1.30			276	1.16			268	1.50	300	0.96	276	1.14	299	1.36	272	2.84
	346	1.16			368	1.12			353	0.94	400	1.13	376	1.14	399	1.13	368	2.39
	433	1.06			437	1.28			442	1.28	500	0.96	470	1.30	496	1.70	461	1.57
	629	1.18							650	1.13	728	1.04	636	1.44	750	1.74	680	1.13
	839	1.07							866	1.47	970	1.74	848	1.15	1000	1.18	919	1.24
Interpolated	0	7.67	0	7.55	0	7.78	0	7.50	0	7.73	0	7.67	0	7.53	0	7.52	0	7.75
	10	7.45	10	7.56	10	7.65	10	7.49	10	7.33	10	7.73	10	7.28	10	7.55	10	7.79
	25	7.49	25	7.49	25	8.03	25	7.35	25	7.50	25	7.69	25	7.43	25	7.53	25	7.76
	50	7.39	50	7.64	50	7.93	50	7.27	50	7.68	50	8.12	50	7.54	50	7.60	50	7.64
	57	7.23	75	8.14	75	7.77	75	7.30	75	7.46	75	7.83	75	7.53	75	7.53	75	7.71
	100	7.46	100	7.63	100	7.48	100	7.30	100	7.45	100	7.75	100	7.37	100	7.69	100	7.86
	150	2.76	150	6.00	150	2.77			150	3.45	150	2.48	150	6.65	150	6.35	150	4.68
	200	2.75	200	3.21	200	1.59			200	2.16	200	1.19	200	2.58	200	2.50	200	4.23
	300	1.22			300	1.12			300	1.18	300	0.96	300	1.12	300	1.36	300	2.62
	400	1.08			400	1.19			400	1.12	400	1.13	400	1.18	400	1.14	400	2.20
	500	1.09			500	1.42			500	1.23	500	0.96	500	1.34	500	1.73	500	1.43
	750	1.14							750	1.23	750	1.07	750	1.37	750	1.74	750	1.16
											1000	1.77			1000	1.18		

8. Data on Salmon-Gill Net Fishing
(鮭鱒流網試験記録)

Operation was supervised by captain and deck officers. All hands were engaged in the work.

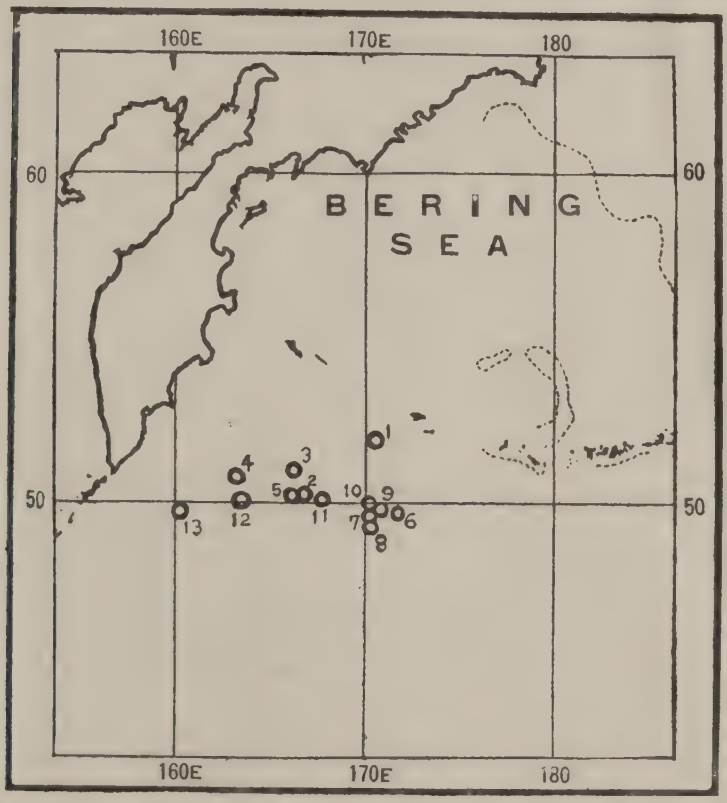

Fig. 9. Location of salmon gill-net set in 1953 cruise of the "Oshoro Maru"

Table 4. Data on salmon gill-net fishing in 1953 cruise to Aleutian waters

No. of Fishing	Date and Time (Ship's time) Net set	Net haul	Position of net set Latitude	Longitude	Amount of gill-net used (Tan)	Direction of drift "toward"	Weather	Wind Direction "from"	Force
1	5~21 1930	5~22 0300	51°-53′ N	170°-23′ E	15	NNE	c	Calm	0
2	5~25 1906	5~26 0340	50°-12′ N	166°-14′ E	26	NW/W	b c	NW	1
3	5~26 1905	5~27 0400	51°-14′ N	165°-59′ E	30	NW	c	SE	1
4	6~ 1 1910	6~ 2 0330	50°-52′ N	163°-15′ E	30	SSE	o	NNW	1
5	6~ 2 1905	6~ 3 0320	50°-10′ N	166°-26′ E	30	S/E	c	NNW	3
6	6~ 5 1900	6~ 6 0340	49°-48′ N	172°-00′ E	30	NNE	r	E	1
7	6~10 1840	6~11 0405	49°-46′ N	170°-15′ E	30	SSW	o	NNW	1
8	6~11 1840	6~12 0040	49°-45′ N	170°-15′ E	30	N/W	c	NE	3
9	6~12 1840	6~13 0400	49°-59′ N	170°-41′ E	30	SW/S	d	NW	4
10	6~14 1835	6~15 0340	49°-57′ N	170°-08′ E	30	N	o	W	2
11	6~15 1850	6~16 0330	50°-07′ N	166°-44′ E	30	N/E	c	S	1
12	6~16 1850	6~17 0345	50°-03′ N	163°-31′ E	30	S/E	f	WNW	1
13	6~17 1905	6~18 0210	49°-55′ N	160°-15′ E	30	SW	o	NE	2

(Continued)

No. of Fishing	Temperature (°C) (0~50m) 0	5	10	20	25	30	40	50	Colour of sea	Transparency (m)	Current "toward"	Catch of fish in individual number per 1 Tan (47m×6.2m) Sockeye ベニ	Chum シロ	Pink マス	King スケ	Silver ギン	Total (計)	Percentage of catch between both sides of the net E (%)	W (%)
1	4.3	3.7	3.6		3.5			3.3	3	25	E	0.60	0.30	0	0	0	0.73	70	30
2	4.3	4.1	3.5		3.2			2.1	3	26	E	0.69	0.57	0	0	0	1.26	70	30
3	4.6	4.6	4.2		3.6			2.5	3	23	E	0.40	1.70	0	0	0	2.10	50	50
4	3.8	3.8	3.8		3.6			1.4	3~4	13	E	0.40	1.70	0	0	0	2.10	90	10
5	3.5	3.5	3.4		3.4			1.7	3	15	E	0.66	0.76	0	0	0	1.42	80	20
6	4.5	4.5	4.5		4.5			4.4	3	13	W	0.66	2.46	0	0	0	3.12	100	0
7	4.0		3.9	3.8		3.7	3.7	3.5	5	13		1.96	0.50	0.03	0	0	2.49	100	0
8	4.6		4.1	4.0		3.8	3.6	3.4	6	9		0.56	2.86	0.06	0	0	3.48	100	0
9	4.8		4.5	3.9		3.8	3.7	3.7	4	12		0.46	1.70	0.06	0	0	2.22	90	10
10	4.5		4.5	4.3		3.9	3.8	3.7	4	14	SE	0.43	2.93	0.20	0	0	3.56	90	10
11	5.8		4.9	4.8		4.4	4.0	3.1	3	17	SE	0.10	1.66	0.13	0	0	1.89	90	10
12	4.4		4.4	4.1		3.4	1.9	1.5	4	18	ESE	0.70	3.33	0.10	0	0	4.13	90	10
13	5.0		4.9	4.4		3.8	3.1	1.0	4	9	ESE	0.13	0.06	0.86	0	0	1.05	60	40

9. Data on Measurement of Biological Characters of Salmon
(鮭鱒生物学的測定記録)

Measurement was made by deck officers and compilation of table was made by K. Kobayashi.

Table 5. Data on measurement of salmon in 1953 cruise to Aleutian waters

Abbreviations:

Sex, F.	Female
M.	Male
T. L.	Total length
F. L.	Fork length
B. L.	Scaled body length
H. L.	Head length
B. H.	Body height
B. W.	Body weight

1. Sockeye salmon, ベニザケ

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
1	F	620	600	565	110	140	2800
	F	600	570	540	105	130	2600
	F	570	550	520	120	110	2200
	M	630	610	570	120	140	3100
	M	620	590	550	120	140	2500
	M	610	570	540	125	140	2800
2	F	640	610	570	122	121	2400
	F	615	570	540	110	124	2600
	F	610	578	552	120	120	2300
	F	590	560	520	110	115	2100
	F	580	570	530	110	117	2300
	F	580	550	520	112	112	2400
	F	570	540	510	110	116	2000
	F	568	545	515	105	130	2100
	M	660	640	600	130	140	3300
	M	640	600	562	125	126	2900
	M	620	598	560	120	130	3000
	M	612	590	546	122	128	2700
	M	610	590	550	121	128	2700
	M	610	584	548	118	112	2200
	M	610	580	540	120	120	2300
	M	610	578	545	120	132	2500
	M	600	565	536	117	114	2100
	M	586	559	520	120	119	2500

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
3	F	630	585	553	122	120	2900
	F	625	610	570	118	130	2900
	F	620	590	555	110	120	2600
	F	610	578	540	120	108	2000
	F	598	580	545	118	115	2100
	F	540	533	500	105	109	1900
	M	660	628	587	140	130	3000
	M	620	610	570	130	126	2900
	M	614	592	554	130	116	2400
	M	590	554	518	120	120	2100
	M	588	550	518	117	122	2400
4	F	606	582	545	132	134	3400
	F	600	572	541	126	114	2300
	M	645	614	580	136	136	3300
	M	630	595	562	127	146	3400
	M	628	600	562	128	132	3000
	M	622	606	566	127	128	2900
	M	622	590	560	120	125	2800
	M	620	586	556	126	130	2600
	M	610	589	564	120	128	2800
	M	610	588	555	119	123	2600
	M	540	506	476	110	102	2600
5	F	628	605	568	122	122	2700
	F	614	583	550	122	130	2700
	F	600	578	540	118	122	2600
	F	600	573	545	116	130	2400
	F	590	574	536	111	120	2400
	F	575	570	536	120	123	2400
	F	570	546	510	115	113	2100
	F	550	506	500	106	112	2000
	M	655	632	580	134	150	3600
	M	642	612	575	136	144	3300
	M	630	610	568	130	124	2600
	M	625	610	574	133	130	3100
	M	615	598	564	120	122	2800
	M	605	585	556	114	120	2700
	M	600	589	550	120	120	2200
	M	600	586	544	113	125	2200
	M	590	562	536	117	117	2200
	M	578	564	522	120	112	2000
	M	572	552	515	112	113	2100
	M	554	533	500	108	105	2000

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
6	F	614	588	556	114	110	2300
	F	590	574	540	114	124	2600
	F	588	570	536	112	114	2000
	F	572	554	526	104	126	2600
	F	570	564	530	106	116	2000
	F	566	544	510	114	114	2000
	F	544	514	482	142	140	3300
	M	652	630	588	136	126	3200
	M	620	604	562	122	134	2600
	M	614	600	562	112	134	2600
	M	612	590	555	124	126	2800
	M	604	584	550	120	124	2500
	M	570	540	530	116	124	2400
	M	564	540	506	108	114	1900
	M	564	524	494	106	108	1800
	M	560	548	512	106	118	2000
7	F	648	622	578	128	128	2600
	F	640	612	570	118	136	3100
	F	638	590	550	124	128	2600
	F	610	578	542	108	128	2300
	F	600	564	520	106	112	2100
	F	600	558	524	102	112	2000
	F	598	562	528	116	124	2300
	F	584	548	518	108	118	2100
	F	580	550	516	104	114	2000
	F	570	540	504	106	110	1900
	F	554	532	500	104	110	1500
	F	552	524	492	94	122	1800
	F	550	538	494	100	120	2000
	F	548	516	488	86	102	1900
	F	546	514	474	98	112	1800
	F	504	478	444	102	102	1400
	M	602	578	538	118	128	2500
	M	598	570	532	108	114	2100
	M	598	570	528	108	110	2100
	M	586	560	530	102	122	2000
	M	580	550	518	96	118	1900
	M	569	557	520	104	116	2000
	M	554	542	506	106	116	1800
	M	546	512	480	102	102	1500
	M	546	510	478	94	104	1600
	M	538	500	468	94	102	1600

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	M	530	498	462	90	102	1300
	M	528	500	478	100	104	1600
	M	524	506	462	92	104	1500
8	F	600	582	548	112	126	2500
	F	600	563	523	123	118	2200
	F	584	546	508	104	118	2200
	M	634	600	556	146	130	2600
	M	598	560	528	116	132	2600
	M	594	561	530	112	120	2200
9	F	650	614	586	116	138	3000
	F	620	596	560	110	134	2900
	F	618	592	556	114	116	2200
	F	586	576	538	120	130	2400
	F	574	550	518	114	122	2400
	F	570	560	522	112	112	2100
	F	570	546	512	106	120	2100
	F	564	530	506	108	108	1600
	F	558	542	514	112	132	2500
	F	554	540	516	112	118	1900
	F	542	530	498	102	120	2100
	M	644	636	584	140	140	3100
	M	636	596	560	130	138	2900
10	F	610	590	552	114	112	2200
	F	600	568	524	126	130	2600
	F	572	542	508	104	116	2000
	F	554	528	498	110	114	2000
	M	628	586	548	124	138	2500
	M	628	584	548	130	126	2500
	M	604	574	540	118	122	2400
	M	600	564	528	114	122	2300
	M	590	564	528	118	116	2000
	M	560	532	500	104	130	2300
11	F	599	575	533	107	133	2900
	F	581	556	521	111	124	2400
	F	559	523	496	101	119	2000
	M	635	605	563	113	131	3500
	M	615	598	543	127	123	2600
12	F	624	592	554	110	132	2700
	F	600	562	528	122	130	2300
	F	548	522	500	108	116	1800

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	M	620	600	568	130	152	3000
	M	614	588	544	118	128	2700
	M	614	582	560	130	124	2500
	M	606	566	524	116	130	2400
	M	600	582	544	110	126	2400
	M	594	560	520	108	128	2300
	M	578	558	526	112	122	2000
13	F	592	570	537	108	118	2500
	M	660	634	598	136	140	3200
	M	625	608	570	126	128	3000
	M	620	592	556	118	128	2800

Table 5. (Continued)

2. Chum salmon, シロザケ

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
1	F	650	620	580	120	150	3100
	F	630	590	560	110	140	2900
	M	680	650	605	135	150	3500
	M	590	570	540	120	110	2200
	M	590	570	540	110	130	2400
2	F	645	620	590	130	140	3100
	F	610	586	550	115	118	2500
	F	600	580	548	118	120	2400
	F	590	570	528	120	110	2200
	F	590	555	520	108	110	2200
	F	575	540	510	110	110	2000
	M	694	645	612	144	130	3200
	M	675	640	590	138	128	3100
	M	620	586	550	130	122	2400
	M	630	590	550	134	128	2300
	M	610	575	542	120	117	2300
	M	610	575	540	130	120	2400
	M	610	572	548	125	114	2200
	M	548	510	480	110	104	1600
3	F	660	625	590	130	126	2900
	F	640	605	570	128	114	2600
	F	625	596	554	122	113	2500
	F	612	580	547	116	103	2100
	F	610	586	546	120	112	2000
	F	600	587	545	119	120	2100

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	F	600	568	535	116	113	2100
	F	600	558	525	118	110	2000
	F	590	560	530	120	108	2000
	F	590	558	530	120	120	2100
	F	590	540	504	113	106	1900
	F	585	550	520	114	110	2100
	F	585	550	520	113	109	2000
	F	580	546	515	112	104	1600
	F	580	536	508	107	105	1900
	F	576	540	508	116	105	1800
	F	575	550	520	116	103	2000
	F	570	556	525	115	114	2100
	F	570	540	503	103	100	1600
	F	570	535	503	104	117	2000
	F	565	540	505	108	110	2000
	F	565	535	502	110	107	1900
	F	565	522	492	114	110	2000
	F	560	516	488	106	102	1600
	F	550	520	494	102	108	1800
	F	530	522	493	114	97	1500
	F	530	505	472	108	105	1700
	M	635	587	550	120	128	2500
	M	630	585	554	130	120	2700
	M	622	582	545	123	115	2600
	M	620	605	568	135	132	3000
	M	620	588	553	125	123	2600
	M	616	578	550	110	108	2100
	M	615	578	538	128	120	2300
	M	610	578	546	122	122	2600
	M	610	576	543	125	124	2400
	M	610	567	530	123	114	2100
	M	610	560	528	127	119	2300
	M	598	558	520	118	110	2100
	M	590	545	517	114	114	2100
	M	580	545	522	118	100	1800
	M	570	540	506	118	110	1800
	M	570	532	502	122	102	1900
	M	560	530	500	115	105	1800
	M	555	520	490	120	104	1600
	M	540	512	487	110	98	1700
	M	540	497	470	108	106	1600
	M	535	492	469	103	99	1500

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
4	F	620	596	560	126	120	2400
	F	620	588	556	125	120	2900
	F	618	585	554	113	112	2400
	F	615	570	545	136	121	2600
	F	610	586	546	120	122	2500
	F	610	580	548	117	123	2400
	F	602	576	544	114	112	2500
	F	600	574	540	116	122	2500
	F	600	570	522	136	125	2500
	F	590	560	530	118	110	2200
	F	588	555	526	116	107	2000
	F	585	560	525	119	114	2200
	F	583	554	528	116	118	2300
	F	580	565	536	125	116	2500
	F	580	562	524	115	110	2100
	F	580	550	515	108	106	2200
	F	578	547	516	120	111	2100
	F	575	554	520	122	113	2200
	F	570	545	510	112	102	1900
	F	568	552	512	114	107	1800
	F	560	530	500	122	117	2100
	M	678	636	604	140	136	3400
	M	670	640	600	140	142	3300
	M	665	628	590	142	129	3100
	M	650	610	566	132	125	3100
	M	640	610	570	130	128	3300
	M	630	597	566	128	112	2400
	M	622	590	557	130	122	2800
	M	620	580	555	122	118	2400
	M	610	587	552	118	121	2500
	M	600	560	530	120	105	2000
	M	605	562	527	124	110	2200
	M	586	554	525	114	108	2100
	M	580	562	524	115	110	2100
	M	580	552	520	120	108	2100
	M	580	550	515	108	106	2200
	M	580	544	510	114	109	2000
	M	578	552	515	111	118	2300
	M	574	550	516	118	108	2000
	M	570	546	517	120	106	2000
	M	570	552	516	116	114	1900
	M	570	544	510	114	108	2000

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	M	570	542	516	106	98	1900
	M	560	545	513	110	104	2200
	M	558	538	507	122	112	1900
	M	542	515	495	103	103	2300
	M	540	508	482	106	106	1700
	M	530	498	476	108	104	1800
5	F	602	582	552	112	116	2500
	F	600	574	541	122	120	2500
	F	600	572	529	132	105	2100
	F	595	570	538	103	105	2000
	F	595	566	530	120	119	2500
	F	580	558	522	121	116	2300
	F	580	554	519	111	113	2200
	F	570	549	515	110	117	2200
	F	558	530	500	102	100	2000
	F	545	515	496	110	100	1800
	M	700	670	625	152	129	3700
	M	650	618	588	145	117	2800
	M	645	616	578	135	128	2800
	M	630	594	554	135	125	2700
	M	595	574	533	119	110	2400
	M	585	564	532	122	122	2500
	M	580	552	520	116	111	2000
	M	572	548	514	112	121	2300
	M	570	545	514	114	106	2000
	M	565	550	520	113	106	2100
	M	553	525	502	112	100	1800
	M	550	530	492	114	96	1600
	M	535	510	487	106	100	1700
6	F	650	622	584	134	147	3400
	F	648	626	590	122	124	2200
	F	640	608	570	120	130	3000
	F	630	594	556	126	132	3100
	F	628	590	550	120	130	2800
	F	620	590	558	118	128	2800
	F	620	584	554	124	120	2500
	F	610	582	548	128	126	2700
	F	608	582	544	112	124	2600
	F	606	574	544	110	122	2500
	F	603	580	540	102	113	2200
	F	600	582	548	114	120	2500

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	F	600	578	546	110	132	3000
	F	596	574	528	104	122	2300
	F	588	576	530	118	112	2000
	F	586	560	516	114	116	2100
	F	580	566	516	106	114	2200
	F	580	548	520	112	106	2000
	F	580	546	514	106	106	2000
	F	576	550	518	114	112	2000
	F	574	534	514	114	132	2400
	F	562	534	508	102	114	2000
	F	562	522	498	106	112	2100
	F	560	540	502	106	116	2000
	F	560	530	502	110	116	2000
	F	554	530	504	110	110	1900
	F	550	516	486	110	106	1800
	F	544	525	498	112	106	1700
	F	530	510	486	104	114	1800
	M	674	640	608	150	138	3400
	M	664	626	584	138	130	3500
	M	660	640	600	134	152	3700
	M	636	612	573	138	134	3600
	M	626	590	552	128	128	2800
	M	624	590	560	114	115	2400
	M	622	602	562	130	150	3400
	M	622	586	554	124	120	3000
	M	618	594	558	104	126	2600
	M	612	585	550	128	125	2700
	M	612	582	570	134	132	3000
	M	610	600	570	128	136	3200
	M	610	584	550	126	120	2000
	M	608	570	540	118	122	2500
	M	602	572	562	128	122	3000
	M	600	576	544	120	122	2600
	M	594	576	550	130	122	2400
	M	590	572	539	112	114	2300
	M	590	566	530	126	128	2500
	M	588	555	530	120	120	2100
	M	588	546	514	114	112	2000
	M	586	544	514	118	124	2200
	M	584	560	528	118	120	2500
	M	584	554	522	120	112	2200
	M	580	560	530	116	116	2400

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	M	568	546	512	114	118	2100
	M	548	530	500	114	122	2100
	M	520	500	474	104	108	2100
7	F	660	614	580	121	124	2800
	F	588	551	512	118	114	2100
	F	584	552	518	116	110	2000
	M	600	560	520	104	118	2300
	M	578	538	502	98	116	2000
	M	564	534	500	104	110	1900
	M	562	522	488	96	118	2600
8	F	643	607	581	120	130	3200
	F	628	590	552	126	120	2600
	F	620	600	560	110	120	2300
	F	610	571	548	118	124	2600
	F	604	572	538	122	116	2200
	F	586	552	512	108	124	2400
	F	586	550	514	118	111	2100
	F	560	534	500	108	108	1900
	F	560	521	494	102	104	1800
	F	550	512	482	98	108	1800
	F	532	501	472	102	104	1700
	M	700	660	613	132	136	3400
	M	683	656	600	142	135	3300
	M	670	631	596	124	131	3200
	M	660	630	588	141	153	4200
	M	640	598	560	113	122	2600
	M	612	581	542	126	118	2400
	M	612	576	542	124	130	2700
	M	608	564	530	112	110	2300
	M	600	568	539	123	120	2400
	M	590	553	520	110	122	2100
	M	586	550	510	112	105	2100
	M	580	550	508	109	107	2300
	M	574	530	504	118	114	2000
	M	562	530	491	119	111	1800
	M	554	520	486	100	106	1800
	M	523	492	442	111	123	1600
9	F	650	604	572	116	136	3200
	F	636	608	528	120	126	2700
	F	620	586	550	122	130	2700
	F	618	596	550	116	128	2700

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	F	616	590	564	114	110	2300
	F	604	590	552	124	124	2700
	F	600	570	544	114	126	2600
	F	584	550	522	110	116	2100
	F	580	558	526	114	124	2400
	F	578	558	530	118	122	2400
	F	578	550	516	106	120	2300
	F	578	546	516	110	116	2100
	F	566	538	506	120	114	2000
	F	564	548	512	104	112	2100
	F	564	540	510	112	116	2000
	F	550	526	500	116	118	2000
	F	542	516	490	104	108	1900
	F	534	514	490	114	106	1700
	M	694	666	614	158	152	3900
	M	688	652	616	150	148	3700
	M	680	638	598	154	140	3600
	M	662	620	586	144	138	3100
	M	658	623	580	144	140	3200
	M	654	618	584	144	130	3100
	M	642	610	576	134	138	3200
	M	636	610	582	138	138	3100
	M	630	596	562	132	134	2900
	M	624	608	568	130	132	3000
	M	624	596	562	122	130	2700
	M	622	590	558	130	134	2900
	M	616	588	552	134	128	2600
	M	614	586	554	124	128	2700
	M	608	576	538	122	116	2500
	M	588	572	540	118	116	2200
	M	588	560	526	112	132	2400
	M	584	558	526	110	114	2200
	M	580	560	536	116	112	2200
	M	576	560	532	114	120	2300
	M	564	546	516	120	122	2300
	M	564	544	510	118	112	1800
	M	538	508	484	122	104	1700
10	F	680	638	592	134	130	3300
	F	674	636	600	106	114	3000
	F	652	604	570	128	128	3000
	F	632	600	558	124	118	2800
	F	628	590	556	132	128	2800

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	F	624	588	546	132	128	2800
	F	610	572	532	118	126	2800
	F	610	570	534	110	120	2500
	F	598	560	522	114	122	2500
	F	598	558	524	118	124	2500
	F	590	564	530	114	126	2500
	F	584	564	536	112	128	2500
	F	582	538	508	114	122	2400
	F	576	530	502	106	104	2000
	M	704	654	616	150	150	4200
	M	701	664	624	150	141	3800
	M	694	661	620	144	136	3600
	M	668	628	588	132	140	3600
	M	650	632	590	140	140	3600
	M	648	616	572	132	128	3000
	M	642	600	562	142	136	3200
	M	634	592	564	130	136	2700
	M	634	582	551	132	136	3200
	M	632	592	546	130	128	2700
	M	624	586	532	128	132	2300
	M	621	590	548	126	124	2600
	M	620	568	534	122	114	2400
	M	618	582	542	130	134	2300
	M	610	574	534	124	130	2600
	M	602	568	526	122	124	2600
	M	600	564	532	112	128	2600
	M	584	554	516	118	120	2200
	M	572	538	498	110	112	2000
	M	572	530	494	112	118	2000
	M	562	528	500	108	114	2100
	M	522	492	466	102	104	1600
11	F	638	640	596	123	137	3500
	F	658	623	590	128	131	3000
	F	653	616	568	120	138	3200
	F	646	608	568	128	125	2900
	F	635	603	557	123	127	2700
	F	605	569	522	114	119	2500
	F	604	578	538	112	121	2100
	F	601	571	533	113	121	2400
	F	595	547	517	118	123	2400
	F	573	537	507	108	118	2700
	F	571	531	501	101	113	2000

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	F	568	533	505	98	113	2000
	F	562	531	502	108	118	2000
	F	518	497	467	92	108	1600
	M	638	607	563	117	132	2800
	M	622	588	542	123	122	2500
	M	619	576	539	123	127	2600
	M	613	576	534	123	137	2800
	M	600	569	529	117	117	2300
	M	593	555	521	113	126	2400
	M	589	559	520	107	122	2300
	M	587	557	521	112	122	2400
	M	578	543	510	113	109	1900
	M	573	542	504	108	117	2000
	M	557	515	488	105	118	1700
	M	522	482	458	107	100	1400
12	F	688	630	588	134	140	3600
	F	660	628	584	128	142	3500
	F	638	610	580	120	134	3000
	F	630	594	554	122	130	2700
	F	622	584	546	126	126	2500
	F	620	574	546	106	108	2400
	F	612	580	542	112	130	2700
	F	600	582	552	112	130	2500
	F	600	582	522	112	118	3500
	F	592	530	502	118	116	1900
	F	591	540	510	110	126	1900
	F	590	556	524	110	126	2200
	F	588	550	518	112	121	2100
	F	582	554	520	104	114	2000
	F	580	542	512	110	114	2000
	F	578	544	512	110	112	1900
	F	576	548	516	120	122	2200
	F	568	540	502	104	120	2100
	F	564	530	500	100	114	2300
	F	558	536	498	100	110	2000
	F	556	544	528	116	130	1600
	F	556	524	500	112	116	1900
	F	552	512	482	112	110	1600
	F	544	510	476	106	106	2300
	M	674	648	614	150	154	3900
	M	660	608	578	144	140	3300
	M	632	604	564	118	132	2700

(Continued)

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
	M	632	591	562	122	124	2500
	M	620	586	554	120	144	3000
	M	620	584	514	130	114	2600
	M	616	578	542	110	140	2500
	M	600	558	522	108	130	2700
	M	590	562	530	114	120	2100
	M	582	550	520	114	120	2200
	M	580	560	534	120	128	2300
	M	580	558	528	122	118	2200
	M	580	554	520	108	128	2700
	M	562	522	484	110	118	2000
	M	560	524	502	104	118	2000
	M	560	520	506	106	112	1700
	M	506	483	452	102	110	2000
13	F	630	598	560	129	137	3000
	F	625	600	560	118	120	2600
	F	620	590	558	118	122	2500
	F	610	580	548	118	120	2500
	F	608	590	540	118	128	2800
	F	605	578	545	125	120	2400
	F	603	590	575	122	122	2600
	F	600	578	540	116	121	2500
	F	598	580	528	112	118	2400
	F	580	560	528	116	115	2400
	F	576	535	512	118	115	2200
	F	570	542	510	103	105	2000
	F	566	542	510	98	107	1900
	F	558	548	510	98	108	2000
	M	674	642	603	141	146	3800
	M	660	635	598	133	146	3600
	M	635	607	573	128	122	2800
	M	608	570	540	120	122	2600
	M	603		575	122	122	2600
	M	600	578	540	122	118	2500
	M	600	572	538	122	121	2500
	M	588	568	532	120	117	2300
	M	586	548	522	116	100	1800
	M	582	551	517	120	115	2100
	M	570	550	522	120	124	2400

Table 5. (Continued)

3. Pink salmon, カラフトマス

No. of Fishing	Sex	T. L.	F. L.	B. L.	H. L.	B. H.	B. W.
7	M	468	442	420	90	106	1200
9	M	520	510	488	100	108	1900
	M	464	444	426	94	98	1200
10	M	504	475	452	94	100	1500
	M	502	482	460	106	112	1500
	M	500	474	444	96	102	1400
	M	490	484	450	104	106	1500
	M	488	464	442	98	104	1200
11	M	512	490	464	93	106	1500
	M	484	454	431	89	100	1400
12	M	500	480	456	100	106	1500
	M	500	470	452	94	113	1500
13	M	470	452	430	100	98	1300
	M	440	420	402	88	80	1000

10. Data on Stomach Contents of Salmon
(鮭鱒胃内容物記録)

Observations were made by N. Ogawa.

Table 6. Data on stomach contents of salmon in 1953 cruise to Aleutian waters

1. *Oncorhynchus nerka* (Walbaum), Sockeye salmon, Red salmon, ベニザケ

No. of fishing	1					2		3		4		5		6		7	
Date	May 21–22					May 25–26		May 26–27		June 1–2		June 2–3		June 5–6		June 10–11	
Position	51°53′N 170°23′E					52° 12′N 166° 14′E		51° 14′N 165° 59′E		50° 52′N 163° 15′E		50° 10′N 166° 26′E		49° 48′N 172° 00′E		49° 46′N 170° 15′E	
No. of fish	1	2	3	4	5	1	2	1	2	1	2	1	2	1	2	1	2
Themisto	149		679	669	602	223	211	1	91	11	28		306	16	628		52
Euphausiids	37	532	121	3	108		21		4	330	287		18	11	11		12
Calanus cristatus					305		523	1	26	26	9		8				
Calanus plumchrus							47										
Brachyura zoea															1		
Diaphus	1	1	2		1		1					1					
Fish larvae																	
Unidentified fragments	c	r	r	r	rr	rr	+	rr	ccc	rr			+	+	+	+	rr
Fragments of fish body			c		c		+				r			+	rr	+	
Plankton, etc.	6.2	25.3	11.1	10.2	18.3	5.6	22.7	0.5	6.1	15.1	10.3		6.0	12.5	10.5		2.2
Diaphus	12.9	3.1	9.0		9.0		4.7					5.5					
Total	19.1	28.4	20.1	10.2	27.3	5.6	27.4	0.5	6.1	15.1	10.3	5.5	6.0	12.5	10.5		2.2

Number of individuals

Weight (gr.)

Table 6. (Continued)

2. *Oncorhynchus keta* (Walbaum), Dog salmon, Chum salmon, シロザケ

	No. of fishing	1					2			3		4		5		6		7	
	Date	May 21–22					May 25–26			May 26–27		June 1–2		June 2–3		June 5–6		June 10–11	
	Position	51°53′N 170°23′E					50°12′N 166°14′E			51° 14′N 165° 59′E		50° 52′N 163° 15′E		50° 10′N 166° 26′E		49° 48′N 172° 00′E		49° 46′N 170° 15′E	
	No. of fish	1	2	3	4	5	1	2	3	1	2	1	2	1	2	1	2	1	2
Number of individuals	*Themisto*	48	106		24					47	34		7	11		12	17		21
	Euphausiids	21	111		11						3	7	15	5	3	7	1	2	
	Calanus cristatus	172	41		8					159	36		9		6	1			
	Calanus plumchrus	56														4	47		
	Diaphus	4	1		1		2	3											
	Fish larvae		1																
	Unidentified fragments	r	r	rr	rr	rr	+		ccc	ccc			c	c		ccc	c	rr	r
	Fragments of fish body	c	c		c		+	r	+		+				r				rr
Weight (gr)	Plankton, etc.	10.8	6.4	1.0	12.5	1.1	4.4		8.0	7.3	3.8		6.3	5.6	3.8	15.5	7.5	0.2	3.3
	Diaphus	17.6	4.1		9.8		18.0	22.0											
	Total	28.4	10.5	1.0	22.3	1.1	22.4	22.0	8.0	7.3	3.8		6.3	5.6	3.8	15.5	7.5	0.2	3.3

Table 6. (Continued)

3. *Oncorhynchus gorbuscha* (Walbaum), Pink salmon, カラフトマス

	No. of fishing	8	
	Date	June 12–13	
	Position	49°59′N, 170°41′E	
	No. of fish	1	2
Number of individuals	*Themisto*	512	477
	Euphausiids	239	81
	Calanus cristatus	594	67
	Limacina helicina	25	204
	Fish larvae	4	2
	Unidentified fragments	+	c
Weight (gr)	Plankton, etc.	28.3	15.5

Ⅱ

1954 CRUISE OF THE "OSHORO MARU" TO THE BERING SEA

おしよろ丸　昭和29年度
ベーリング海航海

1. Cruise Report
（航海報告）

Departure from Hakodate	May 25 （函館出港）
First hydrographic cast	May 26 （海洋観測開始）
Arrival at Bristol Bay	June 8 （ブリストル湾到着）
Training of cadets in crab fisheries aboard "Tōkei Maru" fleet	June 8–13 （東慶丸船団にて蟹刺網実習）
Departure from Bristol Bay	June 13 （ブリストル湾出発）
Passed Amkta Pass	June 18 （アムクタ海峡通過）
First salmon gill-net set	June 20 （鮭鱒流網開始）
Last hydrographic cast	June 20 （海洋観測終了）
Last salmon gill-net set	July 9 （鮭鱒流網終了）
Arrival at Hakodate	July 14 （函館帰港）
Covered 5925 miles in total 51 days at sea.	（総航程5925浬，航海日数51日）

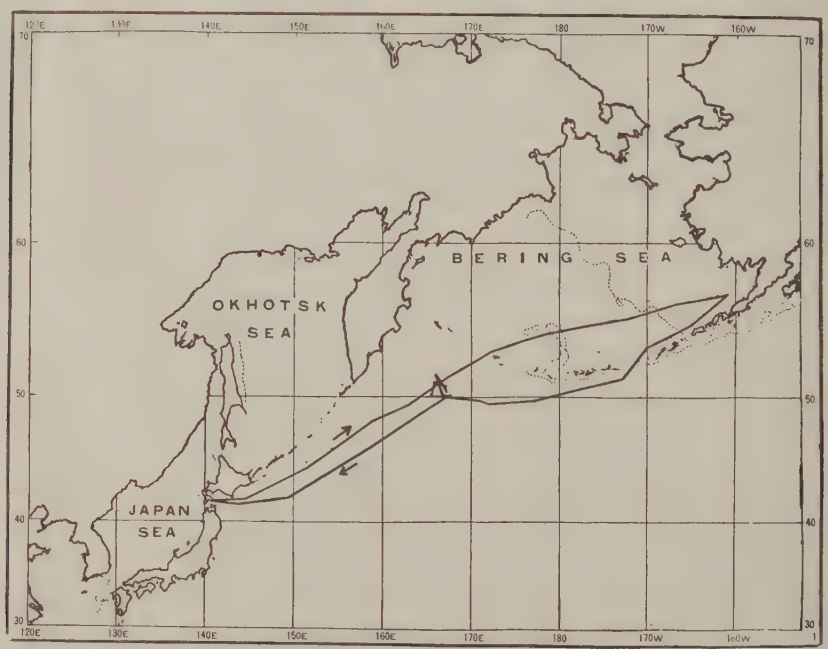

Fig. 10. Track of 1954 cruise of the "Oshoro Maru" to the Bering Sea

2. Members of Staff Aboard
（乗 船 者）

Captain	Seikichi Mishima （船 長 三 島 清 吉）
Crew （乗組員）	

Chief Officer	Shigeo Abe	(一等航海士 阿部茂夫)
Second Officer	Shōji Saito	(二等航海士 斎藤昭二)
Third Officer	Noriyoshi Masuda	(三等航海士 増田紀義)
Junior Third Officer	Satoru Nishiyama	(次席三等航海士 西山悟)
Chief Engineer	Shōichi Tomisawa	(機関長富沢正一)
First Engineer	Kenzō Omi	(一等機関士 尾見健三)
Second Engineer	Ichirō Kataoka	(二等機関士 片岡一郎)
Wireless Operator	Mitsuo Kurotori	(無線通信士 黒鳥満雄)
Purser	Akira Togashi	(事務長富樫章)
Doctor	Tateki Namikawa	(船医並河健樹)
and 24 men		

Research Men (調査員)

Hakodate Marine Observatory	Masaomi Akagawa (Meteorology)	(函館海洋気象台, 赤川正臣, 気象)
Undergraduate Student	Saburō Nakae (Biology)	(学生 中江三郎, 生物)
Undergraduate Student	Yoshiaki Sato (Biology)	(学生 佐藤義明, 生物)

Cadets (実習生)

14 cadets of Undergraduate Course of Pelagic Fishery (遠洋漁業科学生 14名)

Total 52 persons (総員 52名)

3. Specification of Hydrographic Stations
(海洋観測地点)

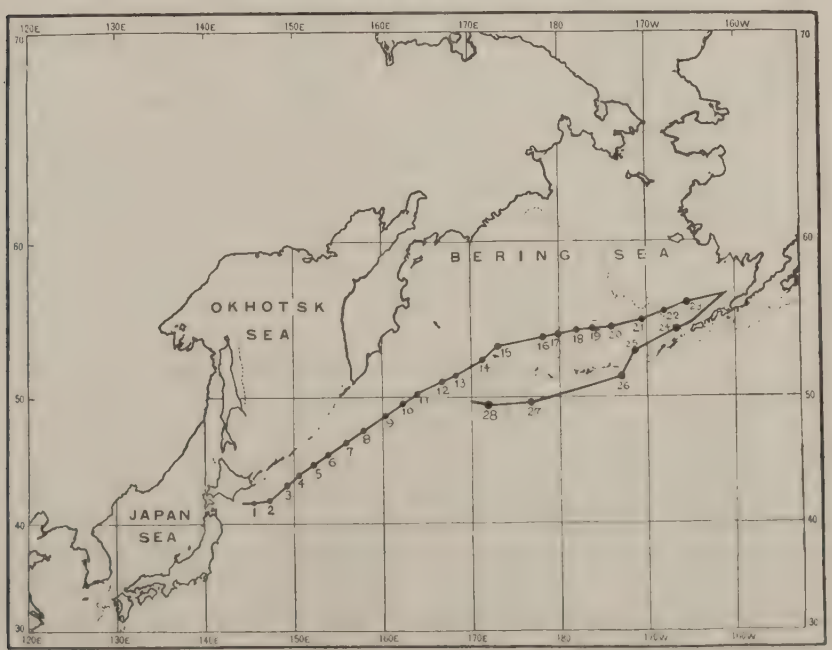

Fig. 11. Hydrographic stations in 1954 cruise of the "Oshoro Maru"

Table 7. Hydrographic stations in 1954 cruise to the Bering Sea

No. of station	Ship's time		Greenwich mean time		Position		Maximum depth of cast (m)
	Date	Hour	Date	Hour	Latitude	Longitude	
Os 1	5～26	1720～1850	5～26	0720～0850	42°-15′N	145°-41′E	973
Os 2	5～27	0500～0630	5～26	1900～2030	42°-43′N	147°-21′E	933
Os 3	5～27	1700～1808	5～27	0700～0808	43°-23′N	148°-51′E	953
Os 4	5～28	0500～0600	5～27	1900～2000	44°-12′N	150°-38′E	954
Os 5	5～28	1700～1815	5～28	0700～0815	45°-04′N	152°-23′E	1003
Os 6	5～29	0500～0605	5～28	1900～2005	45°-59′N	154°-16′E	1001
Os 7	5～29	1700～1800	5～29	0700～0800	46°-52′N	156°-02′E	993
Os 8	5～30	0500～0658	5～29	1900～2058	47°-49′N	157°-59′E	960
Os 9	5～30	1640～1740	5～30	0540～0640	48°-39′N	160°-07′E	1043
Os 10	5～31	0405～0500	5～30	1705～1800	49°-25′N	162°-12′E	1032
Os 11	5～31	1600～1655	5～31	0500～0555	50°-15′N	164°-28′E	1055
Os 12	6～ 1	0400～0500	5～31	1700～1800	51°-03′N	166°-43′E	1052
Os 13	6～ 1	1605～1700	6～ 1	0505～0600	51°-44′N	168°-43′E	1073
Os 14	6～ 2	0400～0455	6～ 1	1700～1755	52°-34′N	171°-04′E	1072
Os 15	6～ 2	1600～1653	6～ 2	0500～0553	53°-14′N	173°-28′E	1010
Os 16	6～ 5	0300～0405	6～ 4	1500～1605	53°-59′N	178°-13′E	795
Os 17	6～ 5	1500～1555	6～ 5	0300～0355	54°-19′N	179°-59′E	966
Os 18	6～ 6	0305～0357	6～ 5	1505～1557	54°-38′N	177°-54′W	972
Os 19	6～ 6	1505～1610	6～ 6	0205～0310	54°-51′N	175°-40′W	992
Os 20	6～ 7	0304～0355	6～ 6	1404～1455	55°-06′N	173°-09′W	997
Os 21	6～ 7	1500～1553	6～ 7	0200～0253	55°-25′N	170°-37′W	1078
Os 22	6～ 8	0222～0237	6～ 7	1322～1337	55°-46′N	167°-58′W	100
Os 23	6～ 8	1400～1410	6～ 8	0100～0110	56°-22′N	165°-16′W	49
Os 24	6～15	0900～0948	6～14	2000～2048	54°-43′N	165°-56′W	232
Os 25	6～16	1505～1526	6～16	0205～0226	52°-43′N	171°-24′W	100
Os 26	6～17	0830～0925	6～16	1930～2025	51°-10′N	172°-52′W	1068
Os 27	6～19	1315～1410	6～19	0115～0210	49°-47′N	176°-11′E	1009
Os 28	6～20	1300～1402	6～20	0200～0302	49°-41′N	171°-16′E	1022

4. Items of Observations and Procedure at Sea
（調査項目及海上作業）

Hydrographic cast（海洋観測）

The same procedure as in 1953 cruise to Aleutian waters.

Plankton sampling（プランクトン採集）

Vertical hauls with 45 cm X 100 cm net from approximately 150 metre depth were made, but later because that net was lost 35 cm X 130 cm net was used, and again this net was lost later. The net was replaced by 30 cm X 90 cm net.

Salmon gill-net set（鮭鱒流網操業）

Specification of the net is:

Material of threads: Amiran

Size of mesh when stretched: 4.2 Sun (13.8 cm)

Number of meshes in horizontal direction: 600 meshes per 1 Tan (30 Ken, 45.4 m)

Number of meshes in vertical direction: 60 meshes per 4 Ken (6 m)

Length of net constructed: 40 Tan (1716m)

Depth of net constructed: 4 Ken (6 m)

Procedure of net set was as in the 1953 cruise.

Biological studies on salmon (鮭鱒の生物学的研究)

About 50 specimens were sampled from the catch of a net set.

5. Publication Issued to the Present
(発表された報告, 研究論文)

(1) Mishima, S. and S. Nishizawa, 1955. Report on hydrographic investigations in Aleutian waters and southern Bering Sea in the early summers of 1953 and 1954. Bull. Fac. Fish., Hokkaidō Univ. Vol. 6, No. 2, pp. 85–119.

(2) Kobayashi, K. and T. Ueno, 1956. Fishes from the northern Pacific and from Bristol Bay. Ibid. Vol. 6, No. 4, pp. 239–265.

6. Data on Temperature and Salinity
(温度塩分記録)

Chlorinity titration, computation of depths, and interpolation of data were made by S. Nishizawa.

Table 8. Temperature and salinity data in 1954 cruise to the Bering Sea

(Reprinted from "Mishima & Nishizawa, 1955. Bull. Fac. Fish., Hokkaidō Univ. Vol. 5, No. 2", but time in St. 3, 5 and 8 is corrected, and some parts of data extrapolated are omitted.)
Time = Ship's time

Station	1		2		3		4		5		6		7		8		9		10	
Lat. Long.	42. 15 N 145. 41 E		43. 43 N 147. 21 E		43. 23 N 148. 51 E		44. 12 N 150. 36 E		45. 04 N 152. 23 E		45. 59 N 154. 16 E		46. 52 N 156. 02 E		47. 49 N 157. 59 E		48. 39 N 160. 07 E		49. 25 N 162. 12 E	
Date	V — 26		V — 27		V — 27		V — 28		V — 28		V — 29		V — 29		V — 30		V — 30		V — 31	
Time	17.30—18.50		05.00—06.30		17.00—18.08		5.00— 6.00		17.00—18.15		5.00— 6.05		17.00—18.00		5.00— 6.55		16.40—17.40		4.05— 5.00	
	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity	Temperature	Salinity
0	4.0	33.14	3.4	33.17	2.4	33.19	2.5	33.15	2.6	33.21	2.0	33.33	1.6	33.21	1.7	33.26	1.5	33.30	1.8	33.30
10	4.04	33.15	3.35	33.15	2.37	33.17	2.30	33.17	2.26	33.17	1.69	33.44	1.41	33.21	1.59	33.24	1.41	33.22	1.79	33.48
25	3.78	33.30	2.40	33.21	2.02	33.17	2.04	33.15	2.02	33.17	1.87	33.30	1.46	33.21	1.64	33.24	1.45	33.24	1.76	33.22
50	3.26	33.30	1.79	33.21	1.79	33.16	1.66	33.21	1.63	33.21	1.65	33.30	1.28	33.21	1.49	33.26	1.38	33.24	1.66	33.24
75	2.36	33.30	1.35	33.26	1.17	33.23	1.23	33.22	1.14	33.22	1.57	33.30	1.17	33.21	1.20	33.30	1.31	33.26	0.84	33.26
100	1.91	33.25	1.13	33.26	0.86	33.28	1.06	33.22	1.46	33.38	1.17	33.46	0.74	33.22	1.02	33.27	1.06	33.24	0.75	33.37
150	0.74	33.39	0.60	33.43	1.45	33.49	1.01	33.44	1.16	33.57	0.64	33.36	1.15	33.44	2.73	33.05	2.14	33.70	2.28	33.58
200	1.41	33.52	1.10	33.49	2.19	33.76	2.07	33.65	1.79	33.76	0.88	33.38	2.64	33.77	3.44	34.03	3.15	33.95	3.37	33.89
300	3.46	33.78	1.71	33.68	2.71	33.94	2.96	33.94	2.54	33.85	2.05	33.74	3.30	34.07	3.45	34.15	3.48	34.13	3.48	34.13
400	3.68	33.91	2.96	33.97	2.77	34.06	3.13	34.12	2.92	34.00	2.36	33.81	3.15	34.16	3.32	34.26	3.32	34.20	3.33	34.25
600	2.98	34.14	2.97	34.23	2.89	34.26	2.90	34.28	2.94	34.34	2.77	34.09	2.98	34.34	3.08	34.36	3.00	34.33	3.09	34.36
800	2.80	34.33	2.83	34.38	2.65	34.36	2.85	34.45	2.80	34.37	2.87	34.37	2.85	34.46	2.80	34.40	2.80	34.44	2.85	34.43
1000									2.53	34.59	2.60	34.69					2.54	34.45	2.58	34.51

Station	11		12		13		14		15		16		17		18		19		20	
Lat.	50. 15 N		51. 03 N		51. 44 N		53. 34 N		53. 14 N		53. 59 N		54. 19 N		54. 38 N		54. 51 N		55. 06 N	
Long.	164. 28 E		168. 43 E		168. 43 E		171. 04 E		173. 38 E		178. 13 E		179. 59 E		177. 54 W		175. 40 W		173. 09 W	
Date	V — 31		VI — 1		VI — 1		VI — 2		VI — 2		VI — 5		VI — 5		VI — 6		VI — 6		VI — 7	
Time	16.00—16.55		4.00— 5.00		16.05—17.00		4.00— 4.55		16.00—16.53		3.00— 4.05		15.00—15.55		3.05— 3.57		15.05—16.10		3.04— 3.55	
	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity
0	3.3	33.33	2.8	33.26	3.1	33.26	4.2	33.10	4.3	33.13	3.8	33.26	4.5	33.33	3.9	33.37	4.2	33.19	4.4	33.39
10	3.17	33.28	2.64	33.26	2.63	33.26	4.12	33.08	3.89	33.13	3.57	33.26	4.04	33.28	3.69	33.28	3.95	33.19	4.27	33.39
25	2.97	33.28	2.60	33.24	2.52	33.26	3.95	33.08	3.78	33.15	3.73	33.26	4.01	33.26	3.64	33.51	3.86	33.17	4.15	33.39
50	2.82	33.28	2.36	33.26	2.46	33.26	3.85	33.08	3.56	33.13	3.76	33.28	3.96	33.26	3.74	33.28	3.45	33.30	3.94	33.39
75	2.34	33.30	2.26	33.24	2.18	33.26	3.34	33.15	3.56	33.17	3.15	33.30	3.82	33.26	2.92	33.31	3.62	33.21	3.06	33.39
100	1.98	33.32	2.05	33.36	1.84	33.26	3.01	33.26	2.99	33.26	2.64	33.31	3.42	33.28	2.36	33.33	3.05	33.28	2.71	33.40
150	2.22	33.48	2.99	33.68	2.83	33.78	2.65	33.36	3.00	33.15	2.77	33.49	2.88	33.35	2.68	33.42	2.38	33.44	2.00	33.46
200	3.54	33.76	3.35	33.97	3.45	34.00	3.72	33.69	3.40	33.46	3.36	33.71	2.91	33.40	2.90	33.51	2.80	33.49	2.88	33.55
300	3.82	34.02	3.64	34.07	3.45	34.11	3.95	34.13	3.94	33.84	3.80	33.91	3.36	33.64	3.40	33.77	3.74	33.87	3.71	33.96
400	3.64	34.12	3.45	34.15	3.35	34.30	3.83	34.05	3.84	33.98	3.72	34.04	3.45	33.89	3.56	33.95	3.66	34.11	3.51	34.11
600	3.41	34.24	3.19	34.26	3.10	34.31	3.58	34.20	3.54	34.16	3.40	34.30	3.38	34.20	3.45	34.16	3.48	34.20	3.38	34.27
800	3.07	34.33	2.90	34.38	2.87	34.38	3.31	34.27	3.23	34.25			3.18	34.27	3.14	34.25	3.15	34.31	3.13	34.42
1000	2.75	34.40	2.70	34.42	2.57	34.43	2.96	34.34	3.11	34.36										

Station	21		22		23		24		25		26		27		28	
Lat.	55. 25 N		55. 46 N		56. 22 N		54. 43 N		52. 43 N		51. 10 N		49. 47 N		49. 41 N	
Long.	170. 37 W		167. 58 W		165. 16 W		165. 56 W		171. 24 W		172. 52 W		176. 11 E		171. 16 E	
Date	VI — 7		VI — 8		VI — 8		VI — 15		VI — 15		VI — 17		VI — 19		VI — 20	
Time	15.00—15.53		2.22— 2.37		14.00—14.10		9.00— 9.48		15.05—15.26		8.30— 9.25		13.15—14.10		13.00—14.02	
	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity	Tem-perature	Salinity
0	5.3	32.84	5.3	32.36	5.0	31.74	5.2	32.72	4.6	33.06	5.2	32.95	4.8	33.13	5.3	33.15
10	5.53	32.84	5.36	32.36	5.06	31.91	5.33	32.70	4.15	33.21	5.72	32.95	4.65		5.14	33.15
25	5.21	32.84	5.15	32.36	0.39	31.91	4.22	32.98	4.61	33.42	4.55	32.95	4.60	33.12	4.94	33.21
50	4.25	32.95	3.74	32.45			4.55	32.90	4.03	33.44	4.89	32.95	4.18	33.15	3.95	33.22
75	4.49	32.90	3.48	32.77			4.15	32.95	4.00	33.51	3.26	33.10	3.43	33.26	2.82	33.22
100	3.10	33.26	3.46	32.95			3.98	33.10	3.86	33.55	3.10	33.26	3.06	33.42	3.34	33.30
150	3.01	33.40					3.59	33.21			3.96	33.77	3.54	33.96	3.65	33.96
200	3.36	33.51					3.70	33.35			4.18	34.04	3.80	34.07	3.67	34.05
300	3.75	33.78									4.06	34.14	3.71	34.18	3.68	34.16
400	3.59	33.91									3.80	34.22	3.39	34.27	3.57	34.31
600	3.30	34.18									3.46	34.33	3.14	34.38	3.27	34.42
800	2.93	34.45									3.18	34.43	2.87	34.49	2.78	34.49
1000	2.54	34.52									2.75	34.52	2.44	34.56	2.52	34.56

7. Data on Displacement Volume of Plankton Samples
(プランクトン排水量記録)

Net was changed two times because of loss at sea.

Net used from St. Os 1 to Os 12 is 45 cm X 100 cm in size, made of bolting silk, GG 56, 54.5 meshes per linear inch.

Net used from St. Os 13 to Os 27 is 35 cm X 130 cm in size, made of bolting silk, GG 40, 39 meshes per linear inch.

Net used from St. Os 32 to Os 42 is 30 cm X 90 cm in size, made of bolting silk, GG 56, 54.5 meshes per linear inch.

At every station vertical haul from approximately 150 metre depth was made. Haul was made after 150 metres of wire was paid out, irrespective of inclination of wire suspended. No flow-meter was provided.

Displacement volume is presented without consideration of filtration coefficient of the net, assuming all organisms existing in the water column have been collected.

Samplings at sea and measurement of displacement in the laboratory were made by Y. Sato.

Table 9. Plankton volume data in 1954 cruise to the Bering Sea

Station	Position	Date	Hour (ship's time)	Temperature of surface water (°C)	Transparency (m)	Net used	Displacement volume of plankton samples in cc per 1000 m^3 of water
Os 1	42°15′N 145°41′E	May 26	1850	4.8	5	45cm net	1140
Os 2	42°43′N 147°21′E	〃 27	0630	3.4	5.5	〃	1300
Os 3	43°23′N 148°51′E	〃 〃	1808	2.4	7	〃	887
Os 4	44°12′N 150°38′E	〃 28	0600	2.5	7.5	〃	591
Os 5	45°04′N 152°23′E	〃 〃	1815	2.6	16	〃	551
Os 6	45°59′N 154°16′E	〃 29	0605	2.2	15	〃	926
Os 7	46°52′N 156°02′E	〃 〃	1800	1.6	20	〃	551
Os 8	47°49′N 157°59′E	〃 30	0658	1.7	15	〃	806
Os 9	48°39′N 160°07′E	〃 〃	1740	1.5	20	〃	276
Os 10	49°25′N 162°12′E	〃 31	0500	1.9	12	〃	630
Os 11	50°15′N 164°28′E	〃 〃	1655	3.3	17	〃	414
Os 12	51°03′N 166°43′E	June 1	0500	2.8	19	〃	492
Os 13	51°44′N 168°43′E	〃 〃	1700	3.1	11.5	35cm net	950
Os 14	52°34′N 171°04′E	〃 2	0455	4.2	21	〃	453
Os 15	53°14′N 173°28′E	〃 〃	1653	4.3	17	〃	678
Os 16	53°59′N 178°13′E	〃 5	0405	3.8	11.5	〃	465
Os 17	54°19′N 179°59′E	〃 〃	1555	4.6	16	〃	488
Os 18	54°38′N 177°54′W	〃 6	0357	4.1	15	〃	520
Os 19	54°51′N 175°40′W	〃 〃	1610	4.2	11	〃	584
Os 20	55°06′N 173°09′W	〃 7	0355	4.4	15	〃	453
Os 21	55°25′N 170°37′W	〃 〃	1553	5.3	8	〃	488
Os 22	55°46′N 167°58′W	〃 8	0237	5.0	9	〃	323
Os 23	56°22′N 165°16′W	〃 〃	1410	5.1	18	〃	193
Os 24	54°43′N 165°56′W	〃 15	0948	5.2	12	〃	421
Os 25	52°43′N 171°24′W	〃 16	1526	4.6	21	〃	130
Os 26	51°10′N 172°52′W	〃 17	0925	5.2	14	〃	995
Os 27	49°47′N 176°11′E	〃 19	1410	4.8	14	〃	205
32	56°42′N 167°10′E	〃 24		5.8	14	20cm net	555
33	50°37′N 167°26′E	〃 25		6.0	15	〃	300
34	50°44′N 167°51′E	〃 26		5.4	14	〃	536
35	50°44′N 165°36′E	〃 29		5.4	13	〃	177
36	50°14′N 166°14′E	July 1		5.4	10	〃	256
38	50°25′N 167°05′E	〃 3		5.2	12	〃	339
39	50°11′N 167°22′E	〃 5		5.8	14	〃	197
40	50°24′N 167°67′E	〃 6		6.0	11	〃	339
41	49°49′N 166°53′E	〃 7		5.7	15	〃	298
42	47°01′N 164°27′E	〃 8		5.9	12	〃	396

8. Data on Salmon Gill-Net Fishing
(鮭鱒流網試驗記録)

Operation was supervised by captain and deck officers. All hands were engaged in the work.

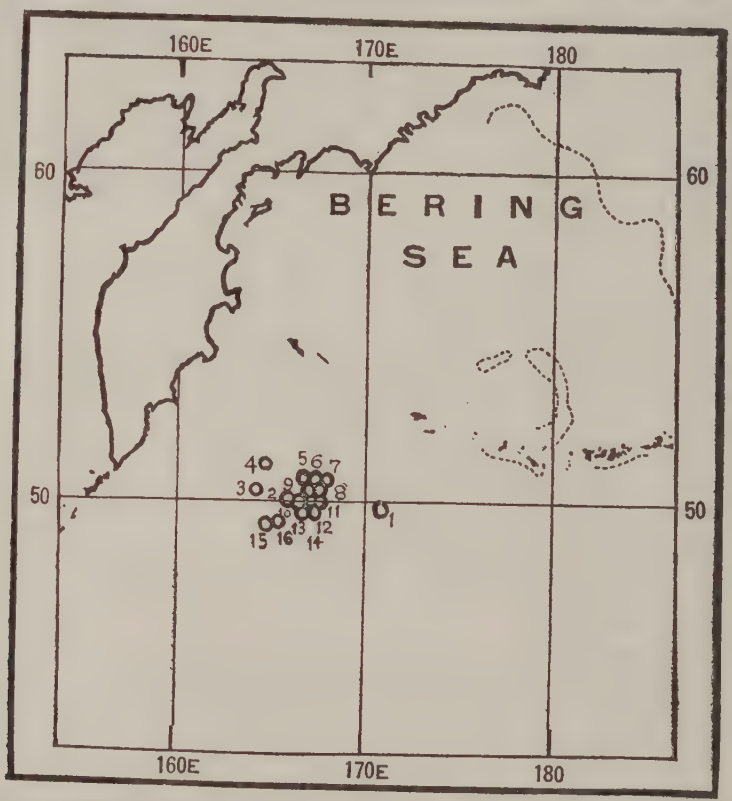

Fig. 12. Location of salmon gill-net set in 1954 cruise of the"Oshoro Maru"

Table 10. Data on Salmon Gill-net Fishing in 1954 cruise to the Bering Sea

No. of Fishing	Date and Time (Ship's time) Net set	Net haul	Position of net set Latitude	Longitude	Amount of gill-net used (Tan)	Direction of drift "toward" (True Bearing)	Weather	Wind Direction "from"	Force
1	6~20 1930	6~21 0410	49°-45′N	170°-44′E	40	160°	c	SW	1
2	6~21 1930	6~22 0350	50°-11′N	167°-30′E	40	340°	o	ESE	2
3	6~22 1830	6~23 0410	50°-21′N	164°-06′E	40	190°	b c	Calm	0
4	6~23 1835	6~24 0430	51°-15′N	164°-47′E	40	10°	c	SSW	1
5	6~24 1900	6~25 0415	50°-42′N	167°-10′E	40	245°	c	NNE	4
6	6~25 1835	6~26 0410	50°-37′N	167°-26′E	40	0°	o	SW	1
7	6~26 1850	6~27 0420	50°-45′N	167°-51′E	40	10°	o	S	3
8	6~29 1750	6~28 0400	50°-19′N	166°-36′E	40	200°	o	NNW	2
9	7~ 1 1750	7~ 2 0415	50°-14′N	166°-14′E	40	30°	o	S	2
10	7~ 2 1750	7~ 3 0350	50°-27′N	167°-09′E	40	15°	f	ESE	3
11	7~ 3 1925	7~ 4 0415	50°-24′N	167°-05′E	40	170°	d	WNW	4
12	7~ 4 1815	7~ 5 0415	50°-11′N	167°-22′E	40	200°	o	W	4
13	7~ 6 1752	7~ 7 0405	50°-23′N	167°-07′E	40	195°	b c	WSW	2
14	7~ 7 1816	7~ 8 0411	49°-49′N	166°-53′E	40	190°	f	W	1
15	7~ 8 1840	7~ 9 0340	49°-00′N	164°-27′E	40	10°	b c	SSE	1

(Continued)

No. of Fishing	Temperature(°C)(0~50m) 0	10	20	30	40	50	Colour of Sea	Transparency (m)	Current "toward"	Catch of fish in individual number per 1 Tan (45.4m×6m) Sockeye ベニ	Chum シロ	Pink マス	King スケ	Silver ギン	Total (計)	Percentage of catch between both sides of the net E (%)	W (%)
1	5.1	4.9	4.7	4.1	4.2	4.2	3	15	E	0.10	3.12	0	0	0	3.22	100	0
2	5.3	5.5	4.4	3.9	3.7	3.5	3	13	E	0.62	3.45	0.52	0.02	0	4.61	100	0
3	5.3	4.9	4.3	3.5	3.1	2.8	3	13	WSW	1.45	1.10	0.75	0.02	0	3.32	90	10
4	5.9	5.5	4.1	3.1	2.6	2.5	3	13	N	0.17	1.47	0.12	0.05	0	1.81	100	0
5	5.7	5.7	3.8	3.3	2.9	2.7	3	14		1.90	3.47	0.95	0.05	0	6.37	90	10
9	6.0	5.7	3.8	3.2	2.5	2.3	3	15	W	2.30	5.05	0.20	0.02	0	7.57	50	50
7	5.4	5.3	4.9	3.6	3.3	3.0	3	14	W	1.50	1.50	0.20	0	0	3.20	90	10
8	5.2	5.2	5.0	3.7	2.9	2.6	4	13		1.32	2.17	1.25	0	0	4.74	70	30
9	5.4	5.3	5.2	4.5	3.6	3.2	4~5	10	W	1.87	1.65	0.75	0	0	4.27	50	50
10	5.4	5.4	5.4	3.8	2.9	2.7	3	14	W	4.22	5.12	0.17	0	0	10.51	80	20
11	5.3	5.3	5.1	4.0	3.4	3.2	3	12	W	2.77	3.52	0.05	0	0	6.34	100	0
12	5.3	5.2	5.0	4.3	3.2	2.9	3	14	W	1.95	1.65	0.05	0	0	3.65	100	0
13	6.0	6.1	5.8	5.6	3.4	3.3	3	10	W	2.50	2.20	0.05	0	0	4.75	90	10
14	5.7	5.4	5.4	4.6	3.6	3.3	3	15		1.60	0.85	0.02	0	0	2.47	90	10
15	5.9	5.7	5.4	4.5	3.1	2.9	5	12		1.37	5.40	0.47	0.02	0	7.26	90	10

9. Data on Measurement of Biological Characters of Salmon
(鮭鱒生物学的測定記録)

Measurement was made by deck officers and compilation of data was made by K. Kobayashi.

Table 11. Data on measurement of salmon in 1954 cruise to the Bering Sea

Abbreviations:

Sex, F.	Female
M.	Male
T. L.	Total length
B. L.	Scaled body length
H. L.	Head length
B. H.	Body height
B. W.	Body weight

1. Sockeye salmon, ベニザケ

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
1	F	628	562	115	145	2900
	F	600	538	115	148	2700
	M	650	590	125	160	3600
	M	630	574	125	130	2600
	M	620	556	128	150	3000
2	M	564	500	106	118	1900
3	F	586	519	106	146	2600
	F	518	462	91	124	1700
	M	596	546	114	124	2400
	M	564	502	106	134	2100
	M	554	502	104	124	2000
	M	508	459	99	129	1900
4	F	610	562	116	152	3500
	F	584	520	108	136	2500
	F	578	520	97	140	2500
	F	561	502	96	140	2200
	F	540	474	104	130	2000
	M	648	582	126	158	3700
	M	646	592	130	154	3400
	M	604	544	115	154	3000
	M	602	546	119	156	3100
	M	600	541	118	149	2700
	M	565	511	110	137	2300
	M	562	504	109	128	2100
	M	550	502	104	136	2200
	M	549	498	106	124	1900
	M	543	488	95	114	1800

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
5	F	586	540	106	148	3000
	F	510	456	85	124	1500
	M	624	554	125	158	3400
6	M	610	550	115	158	3000
	M	535	484	105	114	1700
7	F	613	553	107	152	3400
	F	583	520	106	149	2800
	F	522	472	97	132	2000
	M	664	590	134	170	4300
	M	649	582	125	163	4000
	M	595	536	115	135	2300
	M	573	519	108	140	2500
	M	554	500	110	137	2200
	M	552	494	109	150	2300
	M	546	500	100	135	2100
	M	546	492	104	140	2400
	M	536	480	106	137	1900
	M	490	441	93	120	1500
8	F	596	534	110	140	2700
	F	593	538	107	142	2700
	F	590	532	108	153	2700
	F	590	530	106	145	3000
	F	583	524	104	145	2500
	F	566	504	103	145	2400
	F	558	506	100	140	2500
	F	506	453	92	115	1500
	M	658	595	133	162	3700
	M	624	562	116	145	2700
	M	612	552	110	144	2900
	M	603	542	120	145	2500
	M	592	530	114	150	3000
	M	564	504	106	134	2000
	M	564	503	120	125	2000
	M	556	506	102	137	2200
	M	546	490	105	140	2300
	M	543	484	106	118	1500
	M	538	477	102	134	2400
	M	523	474	95	128	1900
	M	482	428	92	120	1400
9	F	610	540	112	144	2900
	F	585	523	104	130	2500

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	573	512	111	146	2500
	F	570	510	103	135	2100
	F	530	472	97	126	1700
	F	508	454	92	117	1500
	M	622	566	125	166	4000
	M	618	508	126	148	2900
	M	612	548	131	142	2700
	M	574	515	110	130	2300
	M	568	514	121	142	2600
	M	568	510	107	135	2200
	M	565	512	107	136	2100
	M	547	483	110	132	1900
	M	546	489	101	134	2100
	M	516	466	99	121	1700
10	F	622	561	114	150	3100
	F	612	547	113	152	3100
	F	600	542	107	150	2500
	F	598	540	112	136	2500
	F	598	538	108	145	2600
	F	596	536	112	141	2300
	F	592	535	111	141	3000
	F	584	524	106	132	2500
	F	572	516	106	139	2600
	F	568	507	106	137	2600
	F	562	496	105	120	1800
	F	550	499	102	140	2300
	F	548	487	101	130	2000
	F	530	475	94	136	2000
	M	645	583	121	163	4000
	M	643	574	135	144	3500
	M	606	549	120	138	2900
	M	598	538	114	144	3000
	M	571	514	106	131	2400
	M	568	502	106	144	2600
	M	545	488	109	128	2000
	M	520	465	92	117	1800
	M	510	481	96	122	1400
11	F	580	518	112	148	2500
	F	578	520	104	144	2400
	F	575	510	107	148	2900
	F	555	494	98	131	2000
	F	540	489	97	135	2100

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	532	480	92	131	1900
	F	508	452	90	122	1600
	F	505	453	90	113	1600
	M	651	586	123	157	3500
	M	634	560	124	150	3000
	M	612	546	123	145	3100
	M	583	524	107	138	2700
	M	570	512	111	154	2400
	M	568	513	108	142	2500
	M	564	502	107	145	2400
	M	550	486	104	126	1900
	M	525	470	94	112	1500
	M	522	470	104	132	1500
12	F	608	542	116	156	3100
	F	596	538	110	148	3000
	F	593	535	105	152	3000
	F	593	533	117	146	2600
	F	589	538	114	142	2600
	F	582	526	111	152	3000
	F	552	493	99	134	2200
	F	542	494	109	137	2200
	F	539	488	100	122	1900
	M	611	550	111	151	3000
	M	600	541	111	159	3000
	M	564	509	110	135	2300
	M	558	496	95	125	1900
	M	556	510	113	130	2200
	M	551	495	105	122	2000
	M	512	465	104	116	1500
13	F	610	544	113	145	2900
	F	608	545	110	152	3200
	F	602	542	106	140	2600
	F	589	528	103	138	2500
	F	584	523	111	137	2700
	F	581	524	107	140	2500
	F	581	520	99	142	2600
	F	574	518	104	127	2300
	F	571	515	109	125	2100
	F	567	516	102	140	2500
	F	566	503	103	122	2000
	F	560	499	101	132	2000
	F	542	480	100	138	2100

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	508	450	100	125	1500
	M	634	565	126	152	3200
	M	626	553	125	146	3000
	M	616	553	125	142	2900
	M	606	540	120	142	2700
	M	584	523	109	136	2400
	M	566	508	114	143	2300
	M	565	498	107	126	2100
	M	562	500	114	138	2000
	M	552	495	106	137	2200
	M	545	491	113	126	2000

Table 11. (Continued)

2. Chum salmon, シロザケ

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
1	F	604	546	120	140	2800
	M	644	570	135	150	3400
	M	592	542	120	147	2400
2	F	636	560	118	145	3000
	F	634	569	126	144	3000
	F	620	558	124	141	2900
	F	616	546	115	147	2900
	F	614	544	126	152	2800
	F	604	533	109	131	2400
	F	591	528	115	138	2400
	F	589	520	107	125	2200
	F	584	526	113	136	2100
	F	584	520	115	140	2500
	F	581	521	105	130	2100
	F	580	520	109	130	2400
	F	566	514	100	130	2100
	F	563	505	114	130	2100
	F	563	496	108	110	1700
	F	555	490	106	120	1900
	F	542	486	100	110	1800
	M	650	589	133	152	3600
	M	646	580	135	140	3200
	M	638	566	125	160	3400
	M	612	547	116	147	2500
	M	608	536	123	152	2800
	M	604	545	122	136	2200

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	M	598	532	128	137	2300
	M	594	534	111	138	2800
	M	572	510	115	120	2000
	M	552	501	105	131	2000
	M	544	483	108	115	1900
	M	476	432	95	100	1300
3	F	632	562	118	139	2600
	F	606	553	110	141	2900
	F	598	536	106	130	2400
	F	586	531	111	129	2400
	F	579	528	112	146	2800
	F	570	506	101	119	2000
	F	563	504	106	119	1900
	F	560	498	105	120	2000
	F	548	496	102	124	1900
	F	546	496	109	128	2000
	F	519	474	104	108	1700
	M	678	600	147	156	3600
	M	608	538	123	131	2500
	M	604	546	127	134	2400
	M	596	525	116	140	2500
	M	569	500	100	129	2100
4	F	650	579	132	148	3100
	F	616	536	114	128	2400
	F	586	528	116	138	2300
	F	576	514	101	132	2100
	F	570	506	107	124	2000
	F	566	506	110	129	2200
	F	522	476	98	120	1700
	F	522	462	93	110	1500
	M	612	550	125	140	2800
	M	596	538	117	143	2700
	M	581	520	104	129	2200
	M	546	487	106	117	1900
5	F	638	568	117	156	3300
	F	616	548	117	145	2900
	F	590	526	116	145	2500
	F	595	523	116	134	2400
	F	585	510	113	128	2200
	F	575	520	106	130	2200
	F	572	506	120	130	1900

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	566	504	100	135	2000
	F	564	512	111	144	2500
	F	564	512	103	115	2100
	F	564	502	104	132	2100
	F	562	502	109	133	2000
	F	560	497	99	128	1900
	M	674	595	126	146	3400
	M	647	568	136	148	3300
	M	634	562	121	145	3100
	M	627	558	124	145	2900
	M	610	540	124	140	2500
	M	598	524	117	120	2300
	M	596	534	125	141	2500
	M	590	519	117	132	2200
	M	589	528	124	134	2500
	M	584	508	116	123	2300
	M	558	490	106	127	2000
	M	544		106	110	1600
	M	520	476	103	121	1800
6	F	637	561	120	142	2900
	F	630	562	117	140	2800
	F	616	546	124	141	3000
	F	586	515	112	125	2000
	F	582	524	114	138	2500
	F	579	520	118	140	2900
	F	561	500	113	140	2100
	F	556	505	110	130	2100
	F	528	476	100	123	1700
	F	593	524	111	135	2600
	M	658	583	140	158	3700
	M	646	558	124	144	2900
	M	636	516	135	144	3000
	M	634	566	131	142	2900
	M	614	538	129	144	2700
	M	602	536	121	139	2600
	M	590	528	120	133	2400
	M	536	482	111	127	1700
	M	504	457	105	119	1400
7	F	667	596	126	150	3600
	F	246	554	119	140	2600
	F	136	552	113	150	3000
	F	068	547	116	136	2500

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	598	526	113	136	2400
	F	594	540	111	135	2400
	F	592	530	117	125	2000
	F	587	522	114	130	2200
	F	584	532	114	140	2600
	F	574	516	107	136	2500
	F	574	508	108	140	2300
	F	570	518	109	134	2000
	F	570	500	112	125	2100
	F	566	511	112	125	2200
	F	566	506	112	138	2000
	F	551	490	103	125	2000
	M	662	595	134	152	3500
	M	626	560	136	156	3300
	M	616	554	122	147	3000
	M	590	530	125	135	2300
	M	555	506	110	140	2300
8	F	606	540	104	140	2700
	F	584	516	116	134	2400
	F	580	514	105	125	2000
	F	571	514	109	140	2200
	F	570	507	116	130	2000
	F	558	503	109	124	1800
	F	549	492	108	124	1800
	M	598	538	116	140	2700
	M	592	532	117	140	2500
	M	538	486	109	115	1600
9	F	628	560	119	145	3200
	F	622	560	117	150	2800
	F	620	562	119	142	2900
	F	608	542	120	141	2500
	F	599	530	114	138	2400
	F	596	540	115	134	2400
	F	596	523	113	130	2100
	F	577	506	108	134	2300
	F	570	509	106	120	1800
	F	568	504	106	130	2000
	F	558	506	105	128	1900
	F	545	490	106	124	1900
	M	623	549	128	135	2500
	M	608	548	120	141	2600
	M	601	528	126	138	2600

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	M	580	518	125	142	2000
	M	550	488	102	124	1800
10	F	606	546	121	138	2600
	F	601	537	114	135	2800
	F	586	515	107	122	2000
	F	570	509	110	132	2300
	F	590	533	103	129	2500
	F	594	530	119	138	2700
	F	544	485	107	124	2500
	M	626	570	141	159	3600
	M	610	546	126	147	3000
	M	550	490	114	121	1900
	M	602	543	119	144	2800
	M	538	480	104	123	2000
	M	542	480	109	125	1800
	M	492	439	91	115	1400
11	F	646	568	122	150	3500
	F	621	554	115	162	3000
	F	616	548	117	144	2900
	F	604	543	112	141	2500
	F	600	544	112	134	2500
	F	600	539	109	141	2100
	F	596	535	120	148	2500
	F	568	502	111	133	2200
	F	556	490	95	126	1900
	F	552	493	105	124	2400
	M	710	624	160	184	4400
	M	621	560	132	151	3500
	M	621	554	132	153	2900
	M	598	535	115	133	2300
	M	576	518	120	135	2800
	M	576	505	119	145	2400
	M	574	515	120	134	2500
	M	558	500	117	147	1700
	M	547	481	106	122	2000
	M	540	489	102	137	2400
12	F	624	554	128	147	3100
	F	604	543	115	143	2700
	F	602	543	116	145	2700
	F	602	536	116	140	2600
	F	590	533	112	137	2500

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	590	530	117	144	2500
	F	585	424	113	133	2500
	F	578	535	116	136	3000
	F	576	515	106	126	2400
	F	574	519	110	132	2400
	F	572	514	112	136	2500
	F	572	514	109	136	2500
	F	564	505	111	128	2000
	F	562	506	108	123	2000
	M	646	574	136	148	3100
	M	644	574	128	156	3200
	M	593	531	109	139	2500
	M	587	521	120	133	2100
	M	579	520	117	126	2200
	M	572	510	115	135	2500
	M	559	491	120	139	2300
	M	590	522	125	137	2400
13	F	617	550	114	123	2500
	F	594	533	114	137	2500
	F	590	531	110	135	2400
	F	589	524	120	128	2200
	F	580	509	113	131	2200
	F	578	515	106	132	2200
	F	548	487	108	120	1800
	F	536	490	108	125	1700
	M	640	572	132	156	3400
	M	631	572	132	143	3100
	M	622	543	125	144	2700
	M	614	558	123	145	2800
	M	584	526	114	122	2100
	M	555	494	106	127	1900
	M	528	462	107	126	1700
14	F	603	535	116	135	2500
	F	596	535	110	135	2400
	F	592	534	114	130	2500
	F	591	532	105	132	2700
	F	590	517	106	133	2300
	F	589	514	115	134	2500
	F	586	527	113	135	2400
	F	580	519	110	136	2500
	F	580	515	106	132	2500
	F	575	518	106	117	2000

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	F	556	500	105	138	2200
	F	554	496	110	120	1900
	F	552	489	104	121	1900
	F	549	492	105	118	1900
	F	544	475	111	116	2100
	F	541	489	104	115	1900
	F	513	462	100	114	1600
	M	654	587	134	153	3700
	M	642	569	125	149	3300
	M	628	556	132	143	3000
	M	601	533	124	130	2400
	M	595	529	125	132	2500
	M	595	523	120	130	2400
	M	574	504	116	121	2000
	M	572	522	110	128	2500
	M	564	509	107	124	2100
	M	563	498	102	115	1800
	M	554	498	113	123	2000
	M	496	448	101	107	1400
	M	536	477	102	121	1700

Table 11. (Continued)

3. Humpback salmon, カラフトマス

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
3	F	536	488	104	118	1800
	F	446	400	74	98	900
	M	534	483	106	133	1900
	M	518	472	99	126	1700
	M	502	453	101	120	1600
	M	496	448	94	117	1500
	M	475	422	90	114	1300
	M	470	427	92	115	1400
4	M	490	440	90	123	1600
	M	479	434	92	116	1400
5	F	480	432	90	107	1900
	M	531	480	99	135	2000
6	F	500	455	99	124	1400
	M	536	489	110	120	1800
	M	528	488	102	114	1600
	M	506	460	97	120	1700

(Continued)

No. of Fishing	Sex	T. L.	B. L.	H. L.	B. H.	B. W.
	M	504	460	101	122	1500
	M	493	454	96	120	1600
	M	472	421	90	120	1500
	M	470	428	90	114	1400
7	M	478	435	97	121	1500
8	F	488	444	93	120	1300
	M	513	462	101	134	1700
	M	501	453	98	130	1600
9	M	597	550	95	128	1600
	M	574	527	91	116	1400
	M	508	461	102	114	1600
10	M	516	476	102	112	2000
	M	492	446	96	109	1400
	M	473	432	95	114	1300
11	M	516	472	103	140	1600
	M	500	454	104	130	1600
12	F	500	459	94	119	1400
	F	474	436	90	114	1300
13	M	484	438	100	121	1500

10. Data on Stomach Contents of Salmon
(鮭鱒胃内容物記録)

Observations were made by Y. Sato.

Table 12. Data on stomach contents in 1954 cruise to the Bering Sea

1. *Oncorhynchus nerka* (Walbaum), Sockeye salmon, Red salmon, ベニザケ

No. of fishing	3								4													11		12				13
Date	June 22–23								June 23–24													July 3–4		July 4–5				July 6–7
Position	50°21′N 164°06 E								51°15′N 164°47′E													50°24′N 167°05′E		50°11′N 167°22′E				50°23′N 167°07′E
No. of fish	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	1	2	3	4	1
Number of individuals: *Calanus cristatus*	16	163	1120	1	87	1320		5					8	32	70	368	3	2	352	45	39	12	6	31	7	3		
Calanus plumchrus		3		4									4							2	5						7	
Euphausiids		5	1		10				1				36	4	66			20	31	6	85	59		112	194	2	102	
Themisto		720	2	2	3		7	3	595			8		6	11			416		6	10		2		29	3	3	
Amphipods othen than *Themisto*		2					3	1	1			1													2			
Limacina helicina								1										286							38			
Heteropods				11				2									4							1			3	2
Squids	2	1														1		14	3		1							
Squid larvae																								2			1	
Diaphus									1						1			1	2									
Fish larvae								1															1					
Unidentified				2					1	+			2		1	+	1											
Remarks									Empty																			

Table 12. (Continued)

2. *Oncorhynchus keta* (Walbaum), Dog salmon, Chum salmon, シロザケ

No. of fishing	3									4					11		12			13								
Date	June 22–23									June 23–24					July 3–4		July 4–5			July 6–7								
Position	50°23′N 164°06′E									51°150′N 164°47′E					50°24′N 167°05′E		50°11′N 167°22′E			50°23′N 167°07′E								
No. of fish	1	2	3	4	5	6	7	8	9	1	2	3	4	5	1	2	1	2	3	1	2	3	4	5	6	7	8	9
Calanus cristatus	11						264		384	11	910	11			110					3	23	3		5	4	13	4	20
Calanus plumchrus	6	1				2	5				524			1								6						
Euphausiids	145		1	66		2	50	1	34						320	310	152	646	91	3	19		2	68	122	127	23	517
Themisto	5		7	3		4	460	4	105	7	1	356	1	3			1	94	3	4	5	11	1	16	8	5		20
Amphipods other than *Themisto*			2				1													1			3	7			1	1
Limacina helicina	5						3		5			1				31		33		88	5				18	19		51
Heteropods	20		21	26		4	2	6				1				4		28		70	140	6	130	186	81	54	41	29
Squids															1													
Diaphus																											1	
Fish larvae															5													
Tomopteris																2												
Unidentified			+		+											+					+						+	

Number of individuals

Table 12. (Conitnued)

3. *Oncorhynchus gorbuscha* (Walbaum), Pink salmon, カラフトマス

No. of fishing		3			10			
Date		June 22–23			July 2–3			
Position		50°21′N 164°06′E			50°27′N 177°09′E			
No. of fish		1	2	3	1	2	3	4
Number of individuals	*Calanus cristatus*	213	22				116	49
	Calanus plumchrus	6	20				2	
	Euphausiids	4				405	92	66
	Themisto	26	4	1		10	145	11
	Limacina helicina	11				41		
	Heteropods		14					
	Squids	1			1			
	Fish larvae							1
	Unidentified	1					3	1

Table 12. (Continued)

4. *Oncorhynchus tschawytscha*, Spring salmon, マスノスケ

No. of fishing		4
Date		June 23–24
Position		51°15′N 164°47′E
No. of fish		1
Number of individuals	*Calanus cristatus*	5
	Euphausiids	4
	Squids	2

III

1954-55 CRUISE OF THE "OSHORO MARU" TO THE INDIAN OCEAN

おしよろ丸 昭和29年度 印度洋航海

1. Cruise Report
（航海報告）

Departure from Hakodate	Dec. 15, 1954（函館出港）
Arrival at Tokyo	Dec. 18, 〃（東京入港）
Departure from Tokyo	Dec. 23, 〃（東京出港）
Arrival at Kagoshima	Dec. 27, 〃（鹿児島入港）
Departure from Kagoshima	Dec. 30, 〃（鹿児島出港）
Passed Balintang Channel	Jan. 3, 1955（バリンタン海峡通過）
Arrival at Singapore	Jan. 14, 〃（シンガポール入港）
Departure from Singapore	Jan. 17, 〃（シンガポール出港）
Passed Banka Straits	Jan. 18, 〃（バンカ海峡通過）
Arrival at Djakarta	Jan. 20, 〃（ジヤカルタ入港）
Departure from Djakarta	Jan. 24, 〃（ジヤカルタ出港）
Passed Sunda Straits	Jan. 24, 〃（スンダ海峡通過）
First tuna long-line fishing	Jan. 25, 〃（マグロ延縄開始）
Last tuna long-line fishing	Feb. 3, 〃（マグロ延縄終了）
Passed Sape Straits	Feb. 4, 〃（サピ海峡通過）
Arrival at Macassar	Feb. 6, 〃（マカツサル入港）
Departure from Macassar	Feb. 〃 〃（マカツサル出港）
Passed Mindoro Straits	Feb. 11, 〃（ミンドロ海峡通過）
Passed Balintang Channel	Feb. 13, 〃（バリンタン海峡通過）
Arrival at Nagasaki	Feb. 18, 〃（長崎入港）
Departure from Nagasaki	Feb. 21, 〃（長崎出港）
Arrival at Shimonoseki	Feb. 23, 〃（下関入港）
Departure from Shimonoseki	Feb. 26, 〃（下関出港）
Arrival at Tokyo	Mar. 2, 〃（東京入港）
Departure from Tokyo	Mar. 5, 〃（東京出港）
Arrival at Hakodate	Mar. 8, 〃（函館帰港）
Covered 10,633 miles in total 68 days at sea.	（総航程10,633浬，航海日数68日）

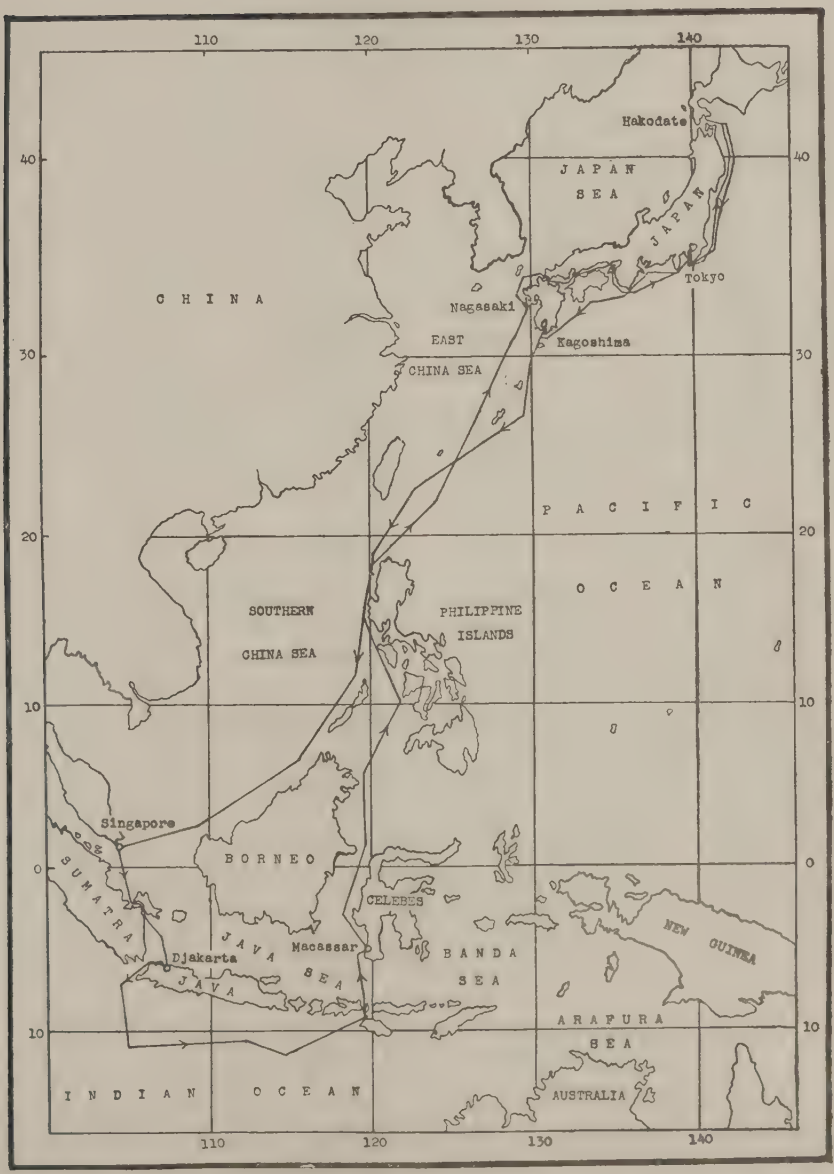

Fig. 13. Track of 1954–55 cruise of the "Oshoro Maru" to the Indian Ocean.

2. Members of Staff Aboard
（乗 船 者）

Captain	Takeji Fujii	（船　長　藤 井 武 治）
Crew（乗組員）		
Chief Officer	Shigeo Abe	（一等航海士　阿 部 茂 夫）
Second Officer	Shoji Saito	（二等航海士　斎 藤 昭 二）
Third Officer	Noriyoshi Masuda	（三等航海士　増 田 紀 義）
Junior Third Officer	Satoru Nishiyama	（次席三等航海士　西 山 悟）
Chief Engineer	Shoichi Tomisawa	（機 関 長　富 沢 正 一）
First Engineer	Kenzo Omi	（一等機関士　尾 見 健 三）
Second Engineer	Ichiro Kataoka	（二等機関士　片 岡 一 郎）
Third Engineer	Tetsusaburo Inomata	（三等機関士　猪 股 鉄三郎）
Chief Wireless Operator	Toshio Kasao	（首席通信士　笠 尾 俊 雄）
Junior Wireless Operator	Mitsuo Kurotori	（次席通信士　黒 鳥 満 雄）
Doctor	Koichi Hara	（船　医　原　貢 一）
Purser	Akira Togashi	（事 務 長　富 樫　章）
and 23 men		（外　23名）
Instructors（指導教官）		
Professor	Ichiro Saito	（教　授　斎 藤 市 郎）
Lecturer	Tsuneyoshi Suzuki	（講　師　鈴 木 恒 由）
Taiyo-Gyogyo Co.	Satoshi Murata	（大洋漁業　村 田　哲）

Cadets（実 習 生）

42 cadets of Advanced Course of Pelagic Fishery（遠洋漁業科特設専攻科学生　42名）

Total 81 persons（総員　81名）

Provisional observers from Government of Indonesia（インドネシヤ政府の見学乗船者）

Rahim Mazir	(from Singapore to Macassar)
Sunar Mijoto	(from Singapore to Macassar)
Soedarsono	(from Djakarta to Macassar)
Soejono	(from Djakarta to Macassar)

3. Specification of Hydrographic Stations
（海洋観測地点）

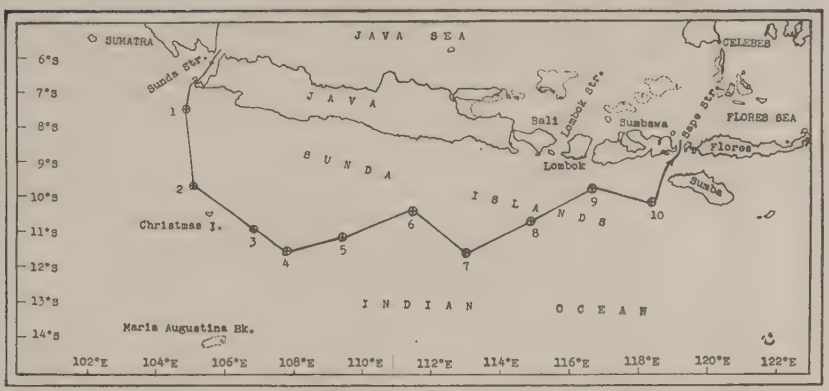

Fig. 14. Hydrographic stations in the Indian Ocean in 1954–55 cruise of the "Oshoro Maru" (Long-line fishing was carried out at the same stations.)

Table 13. Hydrographic stations in 1954–55 cruise to the Indian Ocean

No. of Station	Ship's time		Greenwich mean time		Position		Depth of sea bottom (m)*	Maximum depth of cast (m)
	Date	Hour	Date	Hour	Latitude	Longitude		
Os 1	1–25	0845—1045	1–25	0145—0345	07–32.0S	104–59.0E	2.300m	300m
Os 2	1–26	1636—1706	1–26	1006—1036	09–43.0S	105–12.0E	5.200m	300m
Os 3	1–27	1657—1742	1–27	1027—1112	11–04.2S	106–27.4E	6.000m	300m
Os 4	1–28	1745—1835	1–28	1115—1205	11–40.5S	107–56.5E	5.800m	300m
Os 5	1–29	0915—0950	1–29	0245—0320	11–15.0S	109–35.5E	5.700m	300m
Os 6	1–30	0702—0743	1–30	0032—0113	10–25.0S	111–38.0E	3.800m	300m
Os 7	1–31	0707—0744	1–31	0037—0114	11–42.0S	113–08.4E	4.200m	300m
Os 8	2– 1	0800—0845	2– 1	0130—0215	10–48.0S	114–56.5E	3.000m	300m
Os 9	2– 2	0608—0644	2–1～2–2	2338—0014	09–48.0S	116–48.3E	3.170m	300m
Os 10	2– 3	0645—0716	2– 3	0015—0046	10–10.0S	118–28.0E	3.500m	300m

* Depth assumed from a hydrographic chart.

4. Items of Observations and Procedure at Sea
（調査項目及海上作業）

Hydrographic observations（海洋観測）

Measurement of temperature and salinity was made at every station of tuna long-line fishing for the depths from the surface down to 300 metres.

Tuna long-line fishing（鮪延縄試験）

Ten castings were made in the Indian Ocean south of Java.

Measurement of biological characters on the fish caught by long-line fishing 延縄漁獲魚の生物学的測定

5. Data on Hydrographic Observations
(海 洋 観 測 記 録)

Measurement of temperature was made with electric resistance thermometer for 0–100 metre depths, and with protected reversing thermometer for the depths deeper than 100 metres.

The sea was rather calm throughout the observations, allowing the wire to be suspended nearly vertically, so that no depth correction of observed layer is necessary.

Chlorinity titration was made by H. Koto.

Table 14. Temperature and salinity data in 1954–55 cruise to the Indian Ocean

Station		Os 1	Os 2	Os 3	Os 4	Os 5	Os 6	Os 7	Os 8	Os 9	Os 10
Date		01–25	01–26	01–27	01–28	01–29	01–30	01–31	02–01	02–02	02–03
Time		08–45	16–36	16–57	17–45	09–15	07–02	07–07	08–00	06–08	06–45
Lat. S		07–32.0	09–43.0	11–04.2	11–40.5	11–15.0	10–25.0	11–42.0	10–48.0	09–48.0	10–10.0
Long. E		104–59–0	105–12.0	106–27.4	107–56.5	109–35.5	111–38.0	113–08.4	114–56.5	116–48.3	118–28.0
Weather		b	b c	C	b c	b c	b	b	b c	b c	C
Wind direction		S E	S E	S E	S E	E N E	S E	S W	N	S	N E
Wind force		2	1	3	2	3	1	1	1	1	1
Cloudiness		2	5	8	5	7	2	1	6	5	8
Atmos. pressure (mb)		1011.0	1008.4	1009.2	1009.8	1011.9	1010.6	1010.0	1006.8	1009.2	1009.2
Air temp. (°C)		29.0	26.5	26.3	28.5	24.5	29.0	28.5	29.0	28.5	27.8
Transparency(m)		21	35	31	27	22	45	30	30	50	37
Colour of water		3	1	1	2	1	1	1	2	1	2
Temperature (°C)	0m	28.00	28.50	28.25	27.95	27.60	28.50	28.70	28.60	28.50	28.80
	25m	27.95	28.20	28.15	27.75	28.50	28.75	28.40	28.15	28.10	27.10
	50m	27.90	27.70	26.90	26.00	28.00	27.00	27.10	27.15	26.10	24.60
	75m	27.30	26.00	25.25	24.90	26.65	25.50	25.30	25.20	24.90	23.05
	100m	22.20	22.00	23.05	23.80	23.30	23.71	23.40	23.00	23.50	21.20
	150m	13.25	16.08	17.55	18.34	21.74	19.72	20.87	18.92	18.55	18.48
	200m	14.00	15.70	17.13	17.47	16.17	14.41	16.41	14.90	14.08	14.88
	300m	13.82	14.53	15.05	14.46	15.33	14.14	15.45	14.10	13.75	13.51
Salinity (‰)	0m	31.26	34.11	34.43	34.16	33.53	34.38	34.29	34.16	34.40	33.98
	25m	32.16		34.38	34.23	33.91	34.34	34.34		34.43	
	50m	33.98	34.36	34.34	34.42		34.36	34.42	34.74	34.34	34.52
	75m	33.40	34.54	34.34	34.52	34.43	34.36	34.43		34.56	34.52
	100m	34.47	34.51	34.51	34.67	34.52	34.38	34.40		34.52	34.47
	150m	34.56	34.60	34.78	34.67	34.61	34.51	34.51	34.72	34.60	34.58
	200m	34.65	34.56	34.51	34.63	34.63	34.56	34.76		34.56	34.56
	300m	34.85	34.67	34.79	34.63	34.72	34.61	34.76	34.90	34.56	

6. Data on Tuna Long-Line Fishing
(鮪 延 縄 試 験 記 録)

Five to one hundred Hachi (baskets) of long-line were used. One Hachi (basket) contains 180 metres of long-line with 4 hooks. The depth at which hooks were hung was usually 42–40 metres.

According to Dr. Strasburg, the scientific names and Japanese names in the list on page 57 may be changed to:

2. Parathunnus mebachi (Kishinouye) to P. sibi (Temminck & Schlegel)
*3. Thinnus maccoyi (Castelnan) to Thunnus maccoyi (Castelnau)
4. Germo germo (Lacepede) to G. alalunga (Bonnaterre)
6. Makaira mitsukurii (Jordan & Snyder) to M. audax (Philippi)
7. Makaira marlina Jordan & Evermann to Istiompax marlina (Jordan & Hill) and giant black marlin to white marlin
8. Makaira mazara (Jordan & Snyder) to M. ampla (Poey)
(* Typegraphical error)

Feb. 28, 1958, S. Motoda

Parathunnus mebachi (Kishinouye), Big-eyed tuna, メバチ

Thinnus maccoyi (Castelnan), Southern Australian bluefin, インドマグロ, インドクロマグロ

Germo germo (Lacépède), Albacore, ビンチョウ, ビンナガ

Istiophorus orientalis (Temminck & Schlegel), Sail fish, バショウカジキ

Makaira mitsukurii (Jordan & Snyder), Striped marlin, マカジキ

Makaira marlina Jordan & Evernamm, Giant black marlin, シロカワカジキ

Makaira mazara (Jordan & Snyder), Black marlin, Mazara, クロカワカジキ, マザラ

Carcharinus spp., Shovelnose and allies, ヒラガシラ類

Acanthocybium solandri (Cuvier et Valenciennes), Wahoo, カマスサワラ

Sphyraena spp., Barracudas, カマス類

Thanks are due Dr. Tokiharu Abe for suggesting the English and scientific names of the fish, though the specimens were not examined by him.

Location of Good Catch
(好漁場の位置)

Larger catches were got around such areas those which there was an occurrence of upwelling movement of under-water (table 15, Fig. 15).——T. Fujii——

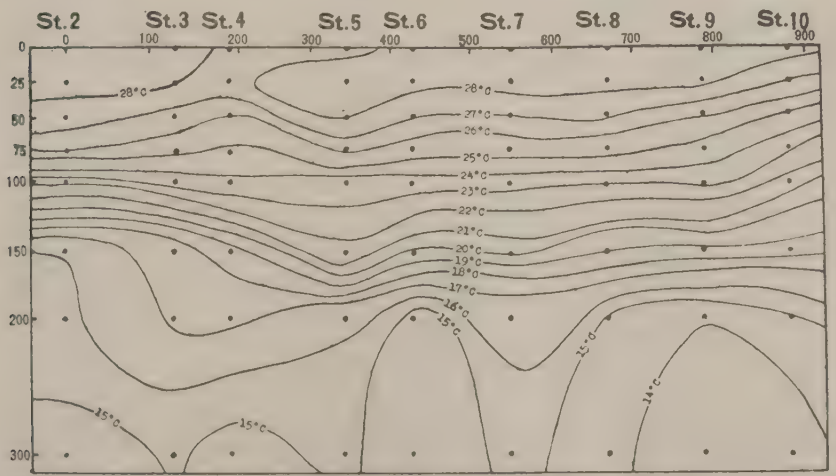

Fig. 15. Vertical section of isotherms of tuna-fishing ground in 1954-55 cruise of the "Oshoro Maru"
No. of station shows corresponding location of long-line set as well as of hydrographic observations.

Table 15. Data on tuna long-line fishing in 1954-55 cruise to the Indian Ocean

No. of fishing		1	2	3	4	5	6	7	8	9	10
Date		Jan. 25	Jan. 26	Jan. 27	Jan. 28	Jan. 29	Jan. 30	Jan. 31	Feb. 1	Feb. 2	Feb. 3
Time	Line set	0710～0755	0624～0744	0545～0714	0540～0703	0532～0655	0546～0745	0555～0720	0515～0617	0450～0604	0513～0639
	Line haul	1245～1445	1220～1614	1205～1650	1222～1740	1215～1645	1210～1542	1200～1543	1038～1418	1210～1552	1249～1850
Noon position of the ship on corresponding day	Latitude	07-31.8	09-44	10-57.5	11-30	11-14	10-40.8	11-27.5	10-47.2	09-48	10-02.5
	Longitude	105-01	105-11	106-23	107-50	109-31.5	111-32.2	113-05.7	114-56.3	116-37	118-29
Length of long line used (Hachi)		50	100	100	100	100	100	100	96	100	66
Tuna and allied fish — Number of individual fish hooked	Yellowfin, キハダ	8	16	8	17	12	2	2	0	2	5
	Big-eyed tuna, メバチ	3	2	5	4	0	0	0	0	1	2
	Southern Australian bluefin, インドマグロ	0	0	4	6	0	4	4	3	0	0
	Albacore, ビンチョウ	0	0	18	19	0	0	0	0	0	1
	Striped marlin, マカジキ	0	1	0	1	0	0	0	0	0	0
	Mazara, クロカワカジキ	0	1	1	7	1	1	0	0	4	1
	Giant blue marlin, シロカワカジキ	0	1	0	2	2	2	0	0	1	0
	Sail fish, バショウカジキ	1	0	0	2	1	0	0	0	1	0
Catch in individual fish per 100 hooks		6.0	5.5	8.8	14.5	4.0	2.3	1.5	0.8	2.3	3.4
Other Fishes hooked (individuals)	Wahoo, カマスサワラ	0	0	3	2	3	1	0	0	0	0
	Barracudas, カマス類	0	0	0	2	1	4	0	0	0	0
	Shovelnose, ヒラカジラ類	0	1	4	1	3	3	1	4	1	0

7. Data on Measurement of Biological Characters of Fish Caught by Long-Line Fishing

(延縄漁獲魚の生物学的測定記録)

Measurement was made by I. Saito, etc.

Table 16. Data on measurement of fishes caught by long line set in 1954–55 cruise to the Indian Ocean

No. of fishing: 1 Jan. 25 07°-31.8′S 105°-01′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
1	Yellowfin		145		74			♀		
2	〃		143		70			〃		
3	〃		138		68			♂		
4	〃		160		87			〃		
5	〃		153		80			〃		
6	〃		98		18			♀		
7	〃		112		50			♂		
8	〃		135		55			♀		
9	Big-eyed tuna		144		79			♂		
10	〃		140		90			〃		
11	〃		140							
12	Sail fish		191		25			♂		

Table 16. (Continued)

No. of fishing: 2 Jan. 26 09°-44′ S 105°-11′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
13	Yellowfin	Dead	126	34	45	None	22	♂	300	
14	〃	〃	135	38	61	〃	22	〃	294	
15	〃	〃	66	17	5	〃	24.5			
16	〃	〃	67	18	5	〃	23.2		450	Cuttle fish, shrimp
17	〃	〃	134	32	58	〃	24.1	♂	300	Shrimp
18	〃	〃	137	38	57	〃	23.0	〃	550	Cuttle fish, shrimp
19	〃	〃	143	40	70	〃	22.8	〃	350	Cuttle fish, young fish

(Continued)

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
20	Yellowfin	Alive	145	41	74	None	25.4	♂	500	Cuttle fish Octopus, young fish
21	〃	〃	137	38	68	〃	23.5	〃	450	Cuttle fish, young fish
22	〃	〃	144	38	70	〃	18.9	〃	430	Cuttle fish, shrimp
23	〃	〃	138	33	58	〃	27.0	〃	320	Cuttle fish, young fish, *Conger myriaster*, shrimp
24	〃	Dead	135	36	65	〃	19.4	♀	600	
25	〃	〃	141	35	75	〃	26.3	♂	700	Octopus, cuttle fish, *Trichitus japonicus*
26	〃	〃	69	18	10	〃	24.2			
27	〃	〃	125	35	50	〃	24.6	♂	550	
28	〃	〃	123	31	42	〃	26.2	♀	400	
29	Big-eyed tuna	Alive	130	36	53	〃	27.1	〃	300	Shrimp
30	〃	Dead	158	46	115	〃	23.1	♀	46	Shrimp, young fish
31	Striped marlin	〃	153	30	46	〃	25.2	〃		
32	Mazara	Alive	163	37	65	〃	28.1	〃	550	
33	Giant black marlin	Dead	243	52	180	〃	25.6	〃		

Remarks;

Amount of catch per 100 hooks : 5.5 fishes

Catch in percentage with species : Yellowfin 77.4%
Big-eyed tuna 9.0%
Marlin 13.6%

Table 16. (Continued)

No. of fishing : 3 Jan. 27 10°–57.5′S 106°–23′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
34	Yellowfin	Dead	90	26	20	None	17.2	♂	100	Young fish
35	〃	〃	136	38	50	〃	26.5	♀	400	
36	〃	〃	122	30	37	〃	20.0	〃	300	
37	〃	〃	130	28	45	〃	27.1	〃	700	
38	〃	Alive	134	35	38	〃	19.2			
39	Big-eyed tuna	Dead	157	51		Injured		♂		
40	〃	〃	152	45	82	None	17.4	〃	700	
41	〃	〃				Injured		〃		

(Continued)

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
42	Big-eyed tuna	Dead	144	48	70	None	19.9	♀	2800	
43	〃	〃	147	44	79	〃	26.0	〃	2600	
44	Southern Australian bluefin	〃				Injured				
45	〃	〃	161	50	95	None	17.9	♂	4000	Cuttle fish, young fish
46	〃	〃	170	54	120	〃	18.6	〃	3600	
47	〃	〃	163	50	110	〃	18.8	〃	3500	
48	Albacore	〃	100	40	20	〃	19.6			
49	〃	〃	90	26	20	〃	22.8			
50	〃	〃	87	30	19	〃	24.8			
51	〃	〃	86	24	19	〃	21.0			
52	〃	〃	89	28	17	〃	24.7			
53	〃	〃	102	27	22	〃	24.5			
54	〃	〃	91	28	22	〃	25.8			
55	〃	〃	97	34	22	〃	25.1			
56	〃	〃	95	27	21	〃	15.0			
57	〃	〃	95	25	22	〃	14.0			
58	〃	〃	100	27	25	〃	16.0			
59	〃	〃	95	27	20	〃	21.0			
60	〃	〃	100	27	19	〃	24.5			
61	〃	〃	100	29	23	〃	22.5			
62	〃	〃	95	26	20	〃	19.2			
63	〃	〃	98	25	20	〃	22.0			
64	〃	〃	98	25	20	〃	20.9			
65	〃	〃	100	26	25	〃	20.1			
66	Mazara	Alive	168	35	65	〃	23.2	♀		
67	Wahoo	Dead	151	24	28	〃	21.8			
68	〃	〃	129	19	19	〃	25.7	♀	2600	

Remarks;

Amount of catch per 100 hooks : 8.75 fishes

Catch in percentage with species : Yellowfin 13.5%

Big-eyed tuna 13.5%

Southern Australian bluefin 10.9%

(Continued)

Albacore	54.0%
Marlin	2.7%
Wahoo	5.4%

Two albacores escaped from the hooks.

Table 16. (Continued)

No. of fishing: 4 Jan. 28 11°-30′ S 107°-50′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
69	Yellowfin		145			Injured		♂		
70	〃	Dead	115	53	35	None		♀	200	
71	〃	〃	130	55	50	〃		〃	600	
72	〃	Alive	127	52	55	〃	27.0			
73	〃	Dead	125	30	45	〃	25.0	♂	200	
74	〃	Alive	135	34	50	〃		♀		
75	〃	〃	140	44		Injured		♂		
76	〃	Dead	75	19	10	None				
77	〃	〃	140	39	59	〃		♀	500	
78	〃	Alive	135	55	65	〃	26.0	〃	400	
79	〃	Dead	90	23	16	〃	26.0			
80	〃	〃	135	35	48	〃	25.5	♀		
81	Big-eyed tuna		138	38	67	〃		〃	2000	
82	〃	Dead	178	35	62	〃	26.5	♂		
83	〃	〃	120	33	58	〃				
84	〃	〃	120	40	64	〃	28.5	♂	100	
85	Southern Australian bluefin	〃	160	47	95	〃		〃	2600	
86	〃	〃	160	43	95	〃		〃	3500	
87	〃	〃	140	45	50	〃	24.0	〃	2500	
88	〃	〃	140	43	70	〃	26.0	♀	1600	
89	〃	〃	130	45	80	〃	25.0	♂	2500	
90	〃	〃	135	45	73	〃	22.5	♀	1900	
91	〃	〃	130	40	63	〃	24.5	♂		
92	Albacore	〃				Injured				
93	〃	?	90	28	20	None				

(Continued)

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature(°C)	Sex	Weight of gonad (g)	Stomach content
94	Albacore	?	100	28	25	None				
95	〃	Dead	83	27	20	〃	26.0			
96	〃	〃	90	26	22	〃				
97	〃	〃	95	26	20	〃				
98	〃	〃	95	26	20	〃	29.0			
99	〃	〃	93	26	19	〃	23.5			
100	〃	〃	95	25	22	〃	23.0			
101	〃	〃	95	24	20	〃	26.5			
102	〃	〃	97	26	21	〃	24.5			
103	〃	〃	95	28	17	〃	25.0			
104	〃	〃	98	30	20	〃	26.0			
105	〃	〃	90	23	15	〃	23.5	♂		
106	Mazara	〃	220	50	140	〃		♀	4500	
107	〃	Alive	180	37	63	〃	25.0			
108	〃	Dead	185	37	70	〃	27.0	♀	800	
109	〃	Alive	152	33	55	〃	29.5	〃	700	
110	〃	Dead	200	40	120	〃	24.0	〃	9030 ?	
111	〃	〃	200	37	120	〃	27.5	〃	1050	
112	〃	〃	180	35	60	〃	25.0	〃	600	
113	Striped marlin	Alive	180	34	68	〃		〃		
114	〃	Dead				Injured				
115	〃	〃	155	27	30	None	25.5			
116	Giant black marlin	Alive	220	47	140	〃	29.0	♂		
117	〃	〃	200	44	160	〃	28.5	♀		
118	Wahoo	Dead	146	21	20	〃	20.0			
119	〃	〃	125	20	20	〃	25.0			

Remarks;

Amount of catch per 100 hooks : 14.5 fishes

Catch in percentage with species : Yellowfin 29.3%
Big-eyed tuna 7.0%
Southern Australian bluefin 10.4%
Albacore 32.7%
Marlin 20.6%

Table 16. (Continued)

No. of fishing : 5 Jan. 29 11°-14′ S 109°-31.5′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
120	Yellowfin	Dead	170	33	30	None	26.5	♂	200	
121	〃	〃	134	36	45	〃	26.5	〃	300	
122	〃	Alive	135	36	58	〃	28.0	♀	700	
123	〃	〃	120	31	38	〃	27.5	〃	300	
124	〃	Dead	138	35	55	〃	27.8	♂	300	
125	〃	〃	117	33	34	〃	27.4	〃	150	
126	〃	〃	135	39	53	〃	27.5	♀	900	
127	〃	Alive	75	28	10	〃		♂	50	
128	〃	〃				〃				
129	〃	Dead	134	34	50	〃	26.1	♂	450	
130	〃	〃	115	32	34	〃	26.0	〃	290	
131	〃	Alive	95	25	17	〃	27.8	〃	50	
132	Mazara	〃	180	37	100	〃	29.2	♀	1000	
133	Giant black marlin	〃	236	50	160	〃		〃		
134	〃	〃	200	47	120	〃	29.2	〃		
135	Sail fish	Dead	132	21	15	〃	27.8	〃		

Remarks;

Amount of Catch per 100 hooks : 4.0 fishes

Catch in percentage with species : Yellowfin 75%

Marlin 25%

Table 16. (Continued)

No. of fishing : 6 Jan. 30 10°-40.8′S 111°-32.2′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
136	Yellowfin	Alive	140	38	60	None	26.8	♂	600	
137	〃	Dead				Injured				
138	Southern Australian bluefin	Alive	155	50	90	None	31.2	♂	3100	
139	〃	Dead	153	42	92	〃	24.7	〃	4200	
140	〃	〃								
141	〃	〃	140	40	72	None	27.8	♀	2800	

(Continued)

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
142	Mazara	Alive								
143	Giant black marlin	〃	165	32	37	None	28.0	♀		
144	〃	Dead				Injured				
	Wahoo	〃	130	20	11		26.0			

Remarks;

Amount of catch per 100 hooks : 2.25 fishes

Catch in percentage with species : Yellowfin 22.2%

Southern Australian bluefin 44.5%

Marlin 33.3%

Table 16. (Continued)

No. of fishing : 7 Jan. 31 11°–27.5′S 113°–05.7′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
145	Yellowfin	Dead	140	37	58	None	23.8	♂	600	
146	〃	Alive	138	41	55	〃	26.6	♀	1800	
147	Southern Australian bluefin	Dead	151	48	81	〃	24.7	〃	2300	
148	〃	〃	138	47	70	〃	22.1	〃	3200	
149	〃	〃	146	44	88	〃	24.8	♂	3400	
150	〃	Alive	144	45	80	〃	25.8	♀	3100	

Amount of catch per 100 hooks : 1.5 fishes

Catch in percentage with species : Yellowfin 33.3%

Southern Australian bluefin 66.7%

Water temperature at 75 metre layer : 25.1–25.3°C

Table 16. (Continued)

No. of fishing : 8 Feb. 1 10°–47.2′S 114°–56.3′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
151	Southern Australian bluefin	Dead	136	47	76	None	24.6	♀	2000	
152	〃	〃	151	45	83	〃	22.8	♂	2100	
153	〃	〃	146	45	73	〃		♀	2500	

Amount of catch per 100 hooks : 0.8 fishes

Catch in percentage with species : Southern Australian bluefin 100%

Table 16. (Continued)

No. of fishing : 9 Feb. 2 09°-48.0′S 116°-37.0′E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
154	Yellowfin	Alive	138	33	40	None	25.0	♀	600	
155	〃	Dead	81	23	10	〃	26.0	♂	100	
156	Big-eyed tuna	〃	148	55	94.5	〃	25.4	〃	2000	
157	Mazara	Alive	194	39	75	〃	29.8	♀	550	
158	〃	〃	182	31	46	Injured	29.2	〃		
159	〃	Dead	210	44	114	None	20.0	〃		
160	〃	〃	201	41	85	〃	29.4	〃		
161	Giant black marlin	〃	220	42		Injured	29.6	〃	700	
162	Sail fish									

Amount of catch per 100 hooks : 2.25 fishes

Catch in percentage with species : Yellowfin 22.2%
Big-eyed tuna 11.1%
Marlin 66.7%

Table 16. (Continued)

No. of fishing : 10 Feb. 3 10°-02.5′S 118°-29. E

No.	Species	Alive or dead	Fork length (cm)	Body height (cm)	Body weight (kg)	Injury by sharks	Body temperature (°C)	Sex	Weight of gonad (g)	Stomach content
163	Yellowfin	Alive	100	30	41	None	26.0	♀	400	None
164	〃	〃	131	36	48	〃	23.4	〃	700	
165	〃	Dead	147	39	47	〃	26.0	〃	500	
166	〃	〃	135	34	47	〃	24.4	♂	350	
167	〃	Alive	134	33	35	〃	24.5	♀	250	
168	Big-eyed tuna	〃	100	35	30	〃	18.0	〃	420	
169	〃	〃	〃	38	35	〃	20.8	〃	500	
170	Albacore	Dead	91	26	18	〃	23.6			
171	Mazara	Alive	190	43	74	〃	26.0	♂	400	None

Amonnt of catch per 100 hooks : 3.4 fishes

Catch in percentage with species : Yellowfin 55.6%
Big-eyed tuna 22.2%
Albacore 11.1%
Marlin 11.1%

IV

1955 CRUISE OF THE "OSHORO MARU" TO THE BERING SEA AND NORTHERN NORTH PACIFIC (NORPAC PROJECT)

おしよろ丸　昭和30年度
ベーリング海並に北太平洋北部航海
日米加共同北太平洋一斉観測参加
（一部水路部並に水産庁委託調査）

1. Cruise Report
（航海報告）

Departure from Hakodate	June 21 （函館出港）
First hydrographic cast	June 26 （海洋観測開始）
First gill-net set	June 26 （流網試験開始）
Last gill-net set	July 5 （流網試験終了）
Arrival at Bristol Bay	July 16 （ブリストル湾到着）
Training of cadets in crab fisheries aboard "Tokei Maru" fleet	July 17–18 （東慶丸船団にて蟹刺網実習）
Departure from Bristol Bay	July 19 （ブリストル湾出発）
Passed Unimak Pass	July 20 （ウニマク水道通過）
Last hydrographic cast	July 21 （海洋観測終了）
Arrival at Seattle	July 29 （シアトル入港）
Departure from Seattle	Aug. 8 （シアトル出港）
Arrival at Hakodate	Aug. 19 （函館帰港）
Covered 10370 miles in total 59 days at sea	（総航程10370浬，航海日数59日）

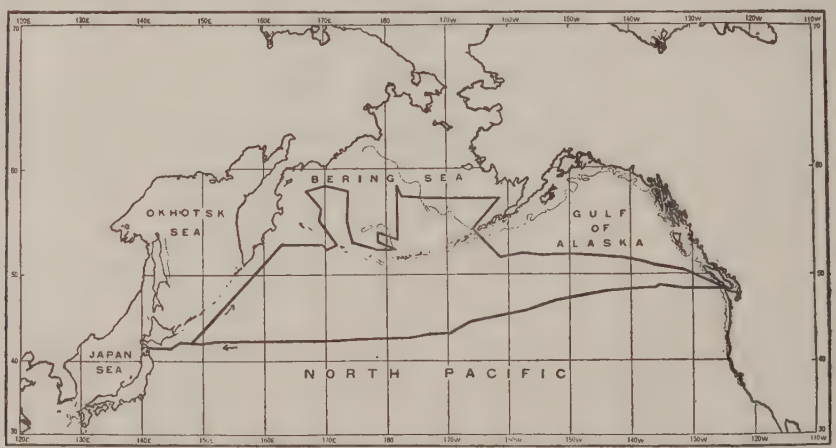

Fig. 16. Track of 1955 cruise of the "Oshoro Maru" to the Bering Sea and northern North Pacific

2. Members of Staff Aboard
（乗 船 者）

Captain	Takeji Fujii	（船 長 藤 井 武 治）
Crew（乗組員）		
Chief Officer	Shigeo Abe	（一等航海士 阿 部 茂 夫）
First Officer	Shoji Saito	（次席一等航海士 斎 藤 昭 二）

Second Officer	Noriyoshi Masuda	(二等航海士　増田紀義)
Third Officer	Satoru Nishiyama	(三等航海士　西山　悟)
Chief Engineer	Shoichi Tomisawa	(機関長　富沢正一)
First Engineer	Yuhachi Yanagiya	(一等機関士　柳谷勇八)
Second Engineer	Ichiro Kataoka	(二等機関士　片岡一郎)
Third Engineer	Tetsusaburo Inomata	(三等機関士　猪股鉄三郎)
Chief Wireless Operator	Toshio Kasao	(首席通信士　笠尾俊雄)
Junior Wireless Operator	Mitsuo Kurotori	(次席通信士　黒鳥満雄)
Purser	Akira Togashi	(事務長　富樫　章)
Doctor	Iku Kikuchi	(船　医　菊地　郁)
and 23 men		(外　23名)

Research Men (調査員)

Professor (Leader)	Sigeru Motoda (Biology) (団長，教授　元田茂，生物)
Assistant Professor	Kenji Kato (Chemistry) (助教授　加藤健司，化学)
Research Assistant	Kiyu Kobayashi (Biology) (助手　小林喜雄，生物)
Research Assistant	Miki Oguro (Chemistry) (助手　小黒美樹，化学)
Research Assistant	Masaaki Fukuda (Physics) (助手　福田雅明，物理)
Graduate Student	Reiich Maeda (Biology) (大学院学生　前田礼一，生物)
Graduate Student	Tamitomo Kashiwakura (Chemistry) (大学院学生　柏倉民知，化学)
Graduate Student	Nobuo Yamada (Chemistry) (大学院学生　山田信夫，化学)
Japan Sea Regional Fisheries Research Laboratory (Fisheries Agency)	Hiroshi Fukataki (Biology) (日本海区水研深滝弘，生物)
	Kenji Tamukai (Physics) (田向健二，物理)

Cadets (実習生)

32 cadets of Undergraduate Course of Pelagic Fishery (遠洋漁業学科学生　32名)

Total 78 persons (総員　78名)

3. Research Committee
(調査委員)

Professor (Coordinator)	Sigeru Motoda	(Plankton) (代表，教授　元田茂，プランクトン)
Professor	Shin-ichi Sato	(Ichthyology) (教授　佐藤信一，魚学)
Professor	Naoichi Inoue	(Turbidity, radio-activity) (教授　井上直一，海水濁度，放射能)
Assistant Professor	Hideto Koto	(Physical oceanography) (助教授　小藤英登，海洋物理)
Assistant Professor	Kenji Kato	(Chemistry) (助教授　加藤健司，化学)
Assistant Professor	Tatsuro Kubo	(Salmon) (助教授　久保達郎，鮭鱒)
Assistant Professor	Takeji Fujii	(Fisheries) (助教授　藤井武治，漁撈)

4. Specification of Hydrographic Stations
(海 洋 観 測 地 点)

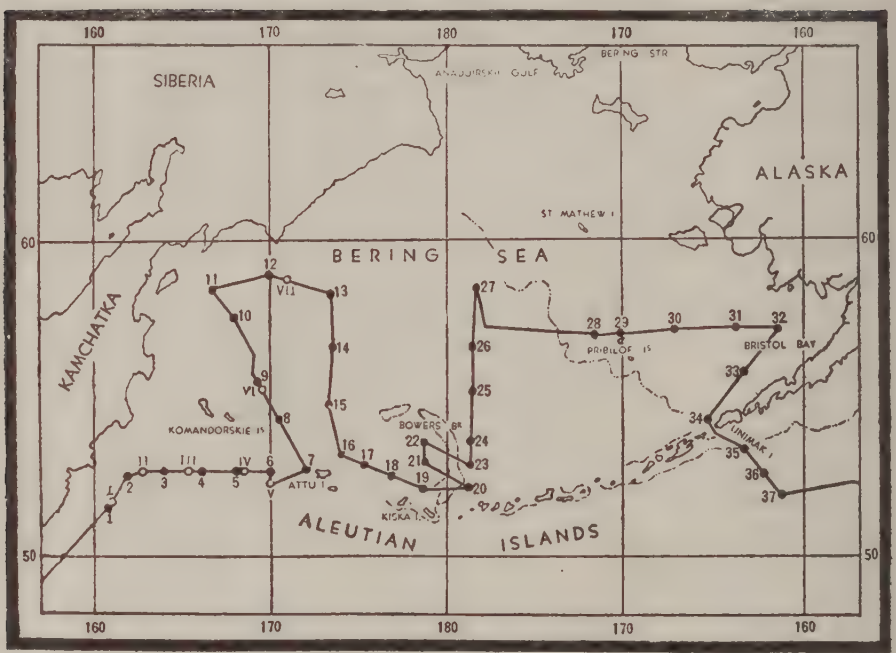

Fig. 17. Hydrographic stations (•) and salmon gill-net stations (○) in 1955 cruise of the "Oshoro Maru"

Table 17. Hydrographic stations in 1955 cruise to the Bering Sea

(Reprinted from "Motoda & Fujii, 1956. Bull. Fac. Fish., Hokkaido Univ. Vol. 6, No. 4")

No. of station	Ship's time Date	Ship's time Hour	Greenwich time Date	Greenwich time Hour	Latitude	Longitude	Depth of sea bottom determined by echo-sounding (m)	Maximum depth of observation (m)
Os 1	June 26	1920~2130	June 26	0820~1030	51° 43′N	160° 39′ E	—	1140
Os 2	27	1423~1630	27	0425~0630	52° 52′N	161 50′ E	—	1270
Os 3	28	1045~1300	28	0045~0300	53° 00′N	161 00′ E	—	1455
Os 4	29	0724~0917	28	2024~2217	53° 01′N	166 00′ E	—	1447
Os 5	29	1723~1927	29	0623~0827	53° 00′N	168° 00′ E	—	1431
Os 6	30	1352~1530	30	0252~0430	53° 02′N	170° 00′ E	—	1482
Os 7	July 1	1400~1530	July 1	0300~0430	53° 02′N	172° 00′ E	—	1485
Os 8	2	0330~0710	1	1630~2010	54° 30′N	170° 33′ E	—	1989
Os 9	3	0535~0830	2	1835~2130	55°—58′N	169° 11′ E	—	1239
Os 10	4	0930~1106	3~4	2230~0006	57° 41′N	167°—59′ E	—	1456
Os 11	4	1910~2050	4	0310~0350	58°—29′N	166° 32′ E	—	1321
Os 12	5	1405~1525	5	0305~0425	59° 00′N	170° 00′ E	1150	984
Os 13	6	1230~1605	6	0130~0505	58°—30′N	173°—15′ E	—	1460
Os 14	7	0540~0705	6	1840~2005	56° 54′N	173° 17′ E	—	1403
Os 15	7	1937~2102	7	0837~1002	55° 10′N	173° 17′ E	—	1400
Os 16	8	0930~1103	7~8	2230~0003	53° 25′N	173°—38′ E	—	1338
Os 17	8	1720~1848	8	0620~0748	53° 10′N	175°—04′ E	—	1353
Os 18	9	0250~0484	8	1550~1734	52° 50′N	176°—56′ E	—	1331
Os 19	9	1210~1310	9	0110~0210	52° 28′N	178°—40′ E	—	1212
Os 20	9~10	2335~0155	9	1135~1355	52° 30′N	178° —54′ W	—	1205
Os 21	10	1655~1913	10	0455~0713	53°—14′N	178°—40′ E	—	1428
Os 22	10′	0020~0138	10	1220~1338	53° 54′N	178°—40′ E	—	1387
Os 23	10′	1220~1353	11	0020~0153	53° 03′N	178°—52′ W	—	1465
Os 24	10′	1920~2100	11	0720~0900	53° 50′N	178°—52′ W	—	1474
Os 25	11	0830~0952	11	2030~2152	55° 34′N	178° —48′ W	—	1329
Os 26	11	1915~2042	12	0715~0842	57° 00′N	178° —58′ W	—	1466
Os 27	12	0810~1115	12	2010~2315	58° 49′N	178°—43′ W	—	1053
Os 28	14	1005~1030	14	2205~2230	57°—16′N	171°—50′ W	105	95
Os 29	14	1645~1705	15	0445~0505	57° —27′N	170°—11′ W	62	50
Os 30	15	0520~0535	15	1720~1735	57°—26′N	167°—05′ W	65	50
Os 31	15	1750~1815	16	0550~0615	57° —23′N	163°—58′ W	59	50
Os 32	16	0500~0600	16	1600~1700	57°—16′N	161° —40′ W	54	50
Os 33	19	1945~2015	20	0645~0715	56° 04′N	163°—15′ W	82	75
Os 34	20	0940~1015	20	2040~2115	54° —45′N	165° —19′ W	170	147
Os 35	20	2220~2350	21	0920~1050	53°—40′N	163°—31′ W	1630	1482
Os 36	21	0625~0800	21	1725~1900	52°—58′N	162°—19′ W	—	1470
Os 37	21	1430~1620	22	0130~0320	52°—15′N	161 09′ W	—	1492

5. Items of Observations and Procedure at Sea
(調査項目及び海上作業)

Meteorological observations (気象観測)

Every-three-hour interval, covering the whole course.

Temperature of surface water (表面水温観測)

Every-hour interval, covering the whole course.

Hydrographic cast (海洋観測)

Cast to 0, 10, 25, 50, 75, 100, 150, 200, 300, 400, 500 600, 800, 1000, 1200 and 1500 m, in a few cases also 2000 m, in length of wire paid out.

In deep cast each Nansen bottle carried two protected thermometers and an unprotected thermometer.

Analyses of water samples (試水分析)

Chlorinity and dissolved oxygen were measured on almost all depths and stations.

Alkalinity, hydrogen-ion concentration, phosphate and silicate were measured aboard on some of samples.

Light scattering by suspended matter in sample water was measured by means of phototube colorimeter aboard on some samples.

For determination of nitrate, calcium, particulate iron, strontium, iodine and deuterium, some of samples were preserved. Sample water for determination of strontium, iodine and calcium were sent to Prof. T. Sugawara of Nagoya University and those for determination of deuterium were sent to the United States.

For storing the sample of sea water polyethyleve bottles were employed in this cwise.

Light absorption coefficient of sea water ***in situ*** (現場海水の光吸収係数)

A turbidity-meter was suspended at various depths from the surface to about 150 metre depth.

Radio-activity of sea water (海水放射能)

A litre of surface water (at two stations also 50 m. depth) was dipped and preserved.

Plankton samplings (プランクトン採集)

Duplicate vertical hauls with standard 45 cm X 165 cm net from approximately 150 m depth at each hydrographic station.

Divided deep hauls with 63 cm coarse mesh net from 2000 m depth at a station.

Duplicate vertical hauls with 20 cm X 70 cm fine mesh net from approximately 50 m depth at each hydrographic station. A sample of two was put on the colorimetric determination of chlorophyll content, and another sample was preserved for later microscopic observations.

Deep hauls with a small twin net from 1000 m or 1500 m depth at each hydrographic station.

Dipping of ca 330 cc of surface water for direct count of phytoplankton cells at each hydrographic station. The samples were sent to the Hakodate Marine Observatory.

Underway samplings with Handy Underway Plankton Catcher II, usually twice a day while underway, covering the whole course.

Fish-larva net tow (稚魚ネット曳航)

130 cm X 450 cm fish larva net was towed at low speed after the hydrographic cast, and also at sun set while underway, covering the whole course.

Dredging (ドレッヂ採集)

Only twice on the shallow bottom in Bristol Bay.

Salmon gill-net set (鮭鱒流網試験)

Seven operations were made at different localities. Specimens were put to the measurement of meristic characters, observation on maturity, sampling of scales for later examination and sampling of stomachs for analysis of their contents.

Eye-observations of sea-birds, whales, etc. (海鳥，鯨等の目視観察)

Any person on the upper deck or on the bridge who became aware of any creature in sight at sea recorded his findings. More than eighty sight records were obtained.

6. Publications Issued up to the Present
(発表された報告，研究論文)

(1) Hydrographic data obtained principally in the Bering Sea by training ship "Oshoro Maru" in the summer of 1955. Spec. Publ. Fac. Fish,, Hokkaido Univ. January 1956.

(2) Correction of data presented in "Hydrographic data obtained principally in the Bering Sea by training ship 'Oshoro Maru' in the summer of 1955" published in January 1956. Spec. Publ. Fac. Fish., Hokkaido Univ. May 1956.

(3) Motoda, S. and T. Fujii, 1956. Report from the "Oshoro Maru" on oceanographic and biological investigations in the Bering Sea and northern North Pacific in the summer of 1955. I. Programme of investigations and records of eye observations of sea-birds and marine mammals. Bull. Fac. Fish., Hokkaido Univ. Vol. 6, No. 4, pp. 280-297.

(4) Inoue, N. and M. Fukuda, 1956. Ditto. II. Radio-activity of sea water. Ibid. Vol. 7, No. 3, pp. 233-235.

(5) Kato, K. 1957. Ditto. III. Particulate iron in the Bering Sea. Ibid. Vol. 7, No. 4, pp. 291-299.

7. Data on Temperature, Salinity and Oxygen, and Computed Data on Dynamic Depth
(温度，塩分，酸素記録及ダイナミックデプス計算値)

Reprinted from "Hydrographic data obtained principally in the Bering Sea by training ship 'Oshoro Maru' in the summer of 1955" but correction of data is made based on the errata presented in "Correction of data presented in 'Hydrographic data obtained principally in the Bering Sea by training ship Oshoro Maru in the summer of 1955' published in January 1956", except the figures in the 16th line of temperature, chlorinity and salinity, and in the 33rd to 38th lines of ^. D and .' st, on page 34 (St. Os 27), which seem to be more correctly calculated in the first report. There might be certainly some unreliablities in some of the data; we were aware that after finishing the chlorinity titration a certain number of sample bottles made of polyethylene which were exposed to air on the table for two weeks before beginning the titration, might have allowed evaporation of water through the wall of the bottle to a slight extent. The data in the deep water of the central Bering Sea seem to be somewhat higher in chlorinity than the data previously reported.

Double titration for chlorinity determination, calculation of depths, interpolation of data, and computation of dynamic depth were made by H. Koto.

Determination of dissolved oxygen and calculation of saturation percentage of it were made by K. Kato and his colleagues aboard the ship.

Table 18. Data on temperature, salinity, oxygen and dynamic depth in 1955 cruise to the Bering Sea

St. Cs 1 | Date 06-26 | Time 0920-1130 | Lat. N51-43 | Long. E 180-30

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)
0		6.0	17.97	32.47
10	0	5.18	18.01	32.54
25	〃	3.01	18.31	33.08
50	〃	-0.57	18.26	33.03
75	〃	-0.64	18.35	33.15
100	0	-0.34	18.38	33.21
150	〃	0.35	18.45	33.33
200	〃	0.63	18.51	33.44
296	0	2.91	18.68	33.76
393	〃	3.40	18.77	33.91
488	〃	3.50	18.86	34.07
583	〃	3.46	18.91	34.16
780	3	3.07	19.02	34.36
970	〃	2.86	19.02	34.36
1151	〃	2.83	19.09	34.49
1440	〃	2.96	19.12	34.54

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	6.0	17.97	32.47	25.58		242
10	5.18	18.01	32.54	25.72	0.023	229
25	3.01	18.31	33.08	26.38	0.053	166
50	-0.57	18.26	33.03	26.56	0.092	149
75	-0.64	18.35	33.15	26.67	0.128	138
100	-0.34	18.38	33.21	26.69	0.162	136
150	0.35	18.45	33.33	26.76	0.229	130
200	0.63	18.51	33.44	26.84	0.302	122
300	2.95	18.69	33.77	26.93	0.441	114
400	3.41	18.77	33.91	27.00	0.824	107
500	3.51	18.87	34.09	27.18	0.698	95
600	3.42	18.92	34.18	27.22	0.792	86
800	3.03	19.02	34.36	27.39	0.868	70
1000	2.86	19.03	34.38	27.43	1.035	66
1200	2.80	19.10	34.51	27.53	1.173	57
1450	2.49	19.12	34.54	27.59	1.369	51

St. Cs 3 | Date 06-28 | Time 0045-0300 | Lat. N53-00 | Long. E 164-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O₂ (ml/L)	Sat. O₂ (%)
0		5.9	18.44	33.31	7.48	105
10	6	5.34	18.43	33.30	8.13	115
25	〃	4.38	18.34	33.13	7.63	108
50	〃	3.56	18.33	33.12	7.67	104
75	〃	1.58	18.45	33.33	7.72	100
100	3	1.48	18.49	33.40	7.55	97
150	〃	2.89	18.75	33.87	2.81	37
200	〃	3.40	18.83	34.02	0.84	11
296	11	3.41	18.87	34.09	0.60	8
391	〃	3.32	18.93	34.20	0.56	8
490	〃	3.21	18.98	34.25	0.76	10
585	〃	3.08	18.99	34.31	0.74	10
780	〃	2.73	19.04	34.40	0.96	13
977	14	2.46	19.06	34.43	0.84	11
1174	〃	2.31	19.09	34.49	0.95	12
1466	23	2.09	19.11	34.52	1.59	20

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.9	18.44	33.31	26.26		177
10	5.34	18.43	33.30	26.30	0.018	173
25	4.38	18.34	33.13	26.38	0.044	175
50	3.56	18.33	33.12	26.36	0.087	169
75	1.58	18.45	33.33	26.69	0.125	136
100	1.48	18.49	33.40	26.75	0.159	131
150	2.89	18.75	33.87	27.02	0.225	134
200	3.40	18.83	34.02	27.09	0.291	127
300	3.41	18.87	34.09	27.14	0.433	94
400	3.31	18.93	34.20	27.24	0.495	84
500	2.20	18.97	34.27	27.31	0.579	78
600	3.05	18.99	34.31	27.36	0.659	74
800	2.70	19.04	34.40	27.45	0.806	64
1000	2.44	19.07	34.45	27.51	0.939	59
1200	2.29	19.09	34.49	27.56	1.063	54
1500	2.05	19.11	34.52	27.61	1.237	49

St. Cs 2 | Date 06-27 | Time 0423-0630 | Lat. N52-52 | Long. E 161-30

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)
0		6.4	18.40	33.24
10	14	6.17	18.36	33.17
24	〃	4.38	18.35	33.15
49	〃	2.85	18.36	33.17
73	〃	0.97	18.43	33.30
91	26	0.96	18.47	33.37
118	37	1.00	18.50	33.42
158	〃	2.58	18.65	33.69
220	48	3.32	18.76	33.89
296	〃	3.37	18.84	34.04
389	〃	3.38	18.84	34.22
448	〃	3.16	18.98	34.29
620	〃	2.86	19.08	34.47
803	49	2.60	19.09	34.49
986	〃	2.43	19.10	34.51
1370	〃	2.91	19.10	34.51

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	st
0	6.6	18.40	33.24	26.13		190
10	6.17	18.36	33.17	26.11	0.019	191
25	4.29	18.35	33.15	26.31	0.046	172
50	2.76	18.36	33.17	26.47	0.087	157
75	0.98	18.43	33.30	26.70	0.124	135
100	0.98	18.48	33.39	26.78	0.157	126
150	1.80	18.62	33.64	26.88	0.219	118
200	1.20	18.73	33.84	26.96	0.277	111
300	3.15	18.83	34.02	27.09	0.383	98
400	3.02	18.96	34.25	27.29	0.471	80
500	3.09	19.02	34.36	27.39	0.552	70
600	2.88	19.07	34.45	27.46	0.621	62
800	2.61	19.09	34.49	27.53	0.748	57
1000	2.42	19.10	34.51	27.56	0.870	54
1200	2.25	19.10	34.51	27.58	0.988	52

St. Cs 4 | Date 06-28 | Time 2084-2217 | Lat. N53-01 | Long. E 166-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)
0		5.8	18.45	33.33
10	13	4.17	18.41	33.26
24	〃	3.05	18.41	33.26
49	〃	1.91	18.43	33.30
73	〃	1.31	18.45	33.33
99	10	1.40	18.46	33.35
148	〃	2.61	18.69	33.77
197	〃	3.41	18.82	34.00
274	21	3.41	18.85	34.05
380	〃	3.32	18.93	34.18
455	〃	3.24	18.94	34.22
549	〃	3.22	19.00	34.33
744	〃	2.90	19.01	34.34
966	22	2.99	19.06	34.43
1153	〃	2.40	19.08	34.47
1447	24	2.15	19.15	34.60

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.8	18.45	33.33	26.28		176
10	4.17	18.41	33.26	26.40	0.017	164
25	3.01	18.41	33.26	26.51	0.041	154
50	1.87	18.43	33.30	26.64	0.078	141
75	1.30	18.45	33.33	26.70	0.113	135
100	1.41	18.46	33.35	26.73	0.147	134
150	2.64	18.70	33.76	26.97	0.308	116
200	3.43	18.82	34.00	27.07	0.361	100
300	3.39	18.86	34.07	27.13	0.361	96
400	3.27	18.94	34.22	27.25	0.453	83
500	3.23	18.96	34.25	27.28	0.536	80
600	3.16	19.01	34.34	27.37	0.616	72
800	2.81	19.02	34.36	27.41	0.767	68
1000	2.55	19.07	34.45	27.50	0.905	60
1200	2.37	19.09	34.49	27.55	1.031	55
1500	2.12	19.16	34.67	27.68	1.198	43

Table 18. (Continued)

St. Cs 5 | Date 06-29 | Time 0823-0827 | Lat. N53-09 | Long. E168-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.8	18.40	33.24	7.89	107
10	3	5.79	18.40	33.24	7.51	105
25	"	3.98	18.40	33.24	7.73	104
50	"	3.53	18.41	33.26	6.43	86
75	"	2.48	18.48	33.30	7.70	100
99	8	1.80	18.44	33.31	7.72	98
149	"	2.37	18.96	33.63	5.33	69
197	"	3.40	18.75	33.87	1.98	26
262	22	3.62	18.83	34.05	0.96	13
376	"	3.80	18.86	34.07	1.28	17
474	"	3.86	18.93	34.20	0.96	13
587	"	3.86	18.94	34.22	0.96	13
780	"	3.09	19.00	34.33	0.70	9
936	"	3.75	19.04	34.40	1.15	15
1149	29	3.95	19.06	34.47	1.35	18
1481	"	2.21	19.09	34.49	0.99	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.8	18.40	33.24	26.21		162
10	5.80	18.40	33.24	26.27	0.018	176
25	3.97	18.40	33.24	26.42	0.043	162
50	3.53	18.41	33.26	26.49	0.033	155
75	2.43	18.48	33.30	26.59	0.121	146
100	1.46	18.44	33.31	26.68	0.156	137
150	2.36	18.96	33.63	26.76	0.222	128
200	3.43	18.76	33.89	26.98	0.292	109
300	3.60	18.83	34.02	27.07	0.389	100
400	3.47	18.89	34.18	27.16	0.488	92
500	3.36	18.98	34.30	27.33	0.580	85
600	3.35	18.95	34.28	27.27	0.668	81
800	2.98	19.02	34.36	27.40	0.838	69
1000	2.70	19.06	34.42	27.46	0.971	63
1500	2.20	19.08	34.47	27.53	1.304	57
1900	2.16	19.09	34.49	27.57	1.398	53

St. Cs 7 | Date 07-01 | Time 0300-0430 | Lat. N53-02 | Long. E172-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.4	18.40	33.24	7.82	109
10	0	5.19	18.39	33.22	7.99	111
25	"	4.76	18.40	33.24	8.35	116
50	"	4.06	18.40	33.24	6.35	86
75	"	3.84	18.40	33.24	7.56	100
100	1	2.89	18.45	33.33	7.01	92
150	"	2.84	18.51	33.44	6.23	82
200	"	3.50	18.86	33.71	3.78	51
262	9	3.64	18.80	33.96	1.45	20
362	"	3.84	18.87	34.09	1.14	15
462	"	3.48	18.90	34.14	0.92	12
561	"	3.41	18.96	34.25	0.92	12
765	12	3.16	19.01	34.34	0.83	11
920	9	2.89	19.04	34.40	0.94	13
1164	12	2.65	19.07	34.45	0.85	11
1485	"	2.34	19.12	34.54	1.24	16

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.4	18.40	33.24	26.26		177
10	5.19	18.39	33.22	26.27	0.018	176
25	4.76	18.40	33.24	26.33	0.044	171
50	4.06	18.40	33.24	26.40	0.086	164
75	3.84	18.40	33.24	26.47	0.128	157
100	2.89	18.45	33.33	26.56	0.184	147
150	2.84	18.51	33.44	26.68	0.236	137
200	3.50	18.86	33.71	26.83	0.301	123
300	3.63	18.81	33.98	27.04	0.418	103
400	3.63	18.87	34.09	27.13	0.518	95
500	3.47	18.90	34.14	27.18	0.614	90
600	3.40	18.97	34.27	27.29	0.705	80
800	3.14	19.01	34.34	27.37	0.864	72
1000	2.87	19.04	34.40	27.44	1.013	65
1200	2.63	19.07	34.45	27.50	1.152	60
1300	2.33	19.12	34.54	27.60	1.340	50

St. Cs 6 | Date 06-30 | Time 0352-0430 | Lat. N49-02 | Long. E170-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.8	18.42	33.28	7.89	106
10	3	4.98	18.42	33.28	9.08	125
25	"	4.15	18.40	33.24	7.99	109
50	"	3.07	18.43	33.30	6.80	86
75	"	1.99	18.44	33.31	8.05	65
100	4	1.76	18.45	33.33	7.97	97
150	"	3.07	18.68	33.75	3.86	48
200	"	3.95	18.82	34.00	1.22	16
296	18	3.06	18.86	34.11	0.82	11
394	"	3.04	18.89	34.18	0.67	9
498	"	3.36	18.94	34.22	0.67	9
598	"	3.19	19.08	34.36	0.76	10
790	"	2.98	19.04	34.40	1.02	14
988	"	2.80	19.05	34.42	0.99	13
1185	9	2.89	19.13	34.56	1.47	19
1682	"	2.16	19.18	34.66	1.11	15

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.8	18.42	33.28	26.24		170
10	4.98	18.42	33.28	26.29	0.018	174
25	4.15	18.40	33.24	26.40	0.043	164
50	3.07	18.43	33.30	26.48	0.033	156
75	1.99	18.44	33.31	26.65	0.130	140
100	1.75	18.45	33.33	26.67	0.156	138
150	3.07	18.68	33.75	26.91	0.219	116
200	3.95	18.82	34.00	27.05	0.274	101
300	3.65	18.89	34.11	27.13	0.374	93
400	3.40	18.89	34.13	27.17	0.470	91
500	3.37	18.95	34.23	27.27	0.560	81
600	3.16	19.03	34.36	27.40	0.638	69
800	2.94	19.04	34.40	27.43	0.784	66
1000	2.86	19.05	34.42	27.47	0.884	62
1500	2.36	19.13	34.56	27.61	1.066	49
1900	2.14	19.18	34.66	27.68	1.216	47

St. Cs 8 | Date 07-01 | Time 1630-2010 | Lat. N54-30 | Long. E170-33

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.0	18.40	33.24	7.86	105
10	0	4.98	18.41	33.26	7.86	106
25	"	4.16	18.43	33.30	7.74	105
50	"	2.77	18.43	33.30	6.33	83
75	"	2.26	18.43	33.30	7.65	99
96	12	1.66	18.45	33.33	7.56	97
147	"	1.60	18.51	33.44	6.32	81
197	"	3.48	18.72	33.84	2.37	32
295	11	3.61	18.88	34.11	0.96	13
394	"	3.52	18.90	34.14	0.72	10
493	"	3.89	18.92	34.18	0.92	12
593	"	3.90	18.97	34.27	0.88	13
792	"	2.96	19.02	34.36	0.70	9
990	14	2.71	19.06	34.43	0.63	8
1177	"	2.50	19.08	34.47	0.99	13
1478	"	2.26	19.12	34.54	0.65	9
1969	18	1.86	19.17	34.63	1.76	23

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.0	18.40	33.24	26.30		173
10	4.99	18.41	33.26	26.32	0.017	172
25	4.16	18.43	33.30	26.43	0.042	161
50	2.77	18.43	33.30	26.58	0.081	149
75	2.26	18.43	33.30	26.69	0.118	145
100	1.64	18.45	33.33	26.68	0.153	137
150	1.62	18.53	33.46	26.76	0.219	128
200	3.43	18.74	33.86	26.95	0.279	112
300	3.61	18.86	34.11	27.14	0.384	94
400	3.50	18.90	34.14	27.18	0.479	90
500	3.38	18.93	34.20	27.23	0.570	85
600	3.39	18.96	34.25	27.31	0.655	78
800	2.95	19.02	34.36	27.40	0.812	69
1000	2.70	19.06	34.43	27.46	0.954	62
1200	2.48	19.08	34.47	27.53	1.085	57
1500	2.25	19.13	34.54	27.61	1.268	49
2000	1.85	19.17	34.63	27.71	1.531	40

Table 18. (Continued)

St. Oa 9 | Date 07-02 | Time 1836-2130 | Lat. N55-58 | Long. E169-11

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		4.9	18.41	33.26	7.65	106
10	28	4.92	18.40	33.24	7.74	107
22	〃	4.89	18.40	33.24	7.90	108
44	〃	3.47	18 41	33.26		—
66	〃	3.55	18.43	33.30	7.79	104
78	39	1.97	18.43	33.30	7.67	99
125	〃	1.47	18.48	33.39	7.43	95
174	〃	3.33	18.67	33.73	3.17	42
237	42	3.67	18.77	33.91	2.37	31
250	57	3.65	18.77	33.91	1.48	20
317	〃	3.63	18.86	34.07	1.34	18
380	〃	3.57	18.89	34.13	0.86	12
519	〃	3.45	18.92	34.18	1.00	13
703	〃	3.09	19.01	34.34	0.93	12
977	58	2.70	19.06	34.43	1.29	17
1239	〃	2.39	19.11	34.52	1.15	15

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	4.9	18.41	33.26	26.33		171
10	4.92	18.40	33.24	26.31	0.017	172
25	4.40	18.40	33.24	26.37	0.043	167
50	3.50	18.42	33.28	26.49	0.083	155
75	3.25	18.43	33.30	26.51	0.121	144
100	1.45	18.44	33.31	26.66	0.156	137
150	2.25	18.55	33.51	26.79	0.222	127
200	3.60	18.74	33.86	26.93	0.285	114
300	3.64	18.84	34.04	27.08	0.392	99
400	3.55	18.89	34.13	27.15	0.491	93
500	3.44	18.91	34.16	27.20	0.586	88
600	3.30	18.96	34.25	27.28	0.674	80
800	2.91	19.02	34.36	27.40	0.833	69
1000	2.67	19.07	34.45	27.49	0.974	61
1200	2.43	19.10	34.51	27.56	1.102	54

St. Oa 11 | Date 07-04 | Time 0610-0950 | Lat. N58-29 | Long. E166-32

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.6	18.34	33.13	7.50	108
9	22	6.47	18.35	33.15	7.56	108
23	〃	4.99	18.40	33.24	8.16	112
46	〃	1.86	18.45	33.33	6.64	85
69	〃	0.79	18.43	33.30	7.79	98
71	45	0.75	18.45	33.33	7.76	97
108	〃	0.78	18.46	33.35	7.42	93
136	〃	0.74	18.49	33.40	7.86	99
230	50	3.25	18.69	33.77	2.80	35
290	〃	3.56	18.79	33.95	1.22	16
367	〃	3.48	18.85	34.05	0.95	13
448	〃	3.42	18.89	34.13	1.93	12
610	〃	3.29	18.98	34.29	1.08	14
809	〃	3.00	19.01	34.34	1.21	16
1042	52	2.70	19.15	34.60	1.19	16
1321	〃	2.36	19.12	34.54	0.78	10

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.6	18.34	33.13	26.02		200
10	6.43	18.35	33.16	26.02	0.020	200
25	4.32	18.40	33.24	26.44	0.047	160
50	1.50	18.46	33.33	26.69	0.084	136
75	0.69	18.45	33.33	26.74	0.118	132
100	0.77	18.46	33.35	26.76	0.151	130
150	0.73	18.52	33.46	26.84	0.214	122
200	2.70	18.64	33.66	26.96	0.274	110
300	3.55	18.80	33.96	27.08	0.387	104
400	3.45	18.87	34.09	27.14	0.489	94
500	3.39	18.93	34.20	27.23	0.582	85
600	3.30	18.96	34.29	27.31	0.668	78
800	3.09	19.01	34.34	27.39	0.825	70
1000	2.76	19.14	34.58	27.59	0.968	51
1200	2.51	19.14	34.58	27.62	1.091	48

St. Oa 10 | Date 07-03~04 | Time 2230-0006 | Lat. N57-41 | Long. E167-59

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		4.8	18.38	33.21	8.02	113
10	5	4.62	18.38	33.21	8.29	114
25	〃	3.19	18.39	33.22	8.45	112
50	〃	1.14	18.40	33.24	6.41	81
75	〃	0.76	18.41	33.26	7.74	97
99	7	0.66	18.40	33.24	8.44	105
150	3	0.63	18.45	33.33	7.63	96
200	〃	0.63	18.46	33.35	7.85	98
269	20	3.35	18.72	33.82	2.82	36
365	〃	3.54	18.82	34.00	1.29	17
460	〃	3.45	18.86	34.11	0.94	13
555	〃	3.39	18.94	34.22	0.85	11
740	〃	3.19	19.00	34.33	1.18	16
936	〃	2.86	19.03	34.38	0.67	9
1162	17	2.59	19.07	34.45	0.86	12
1496	〃	2.24	19.12	34.54	0.80	10

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	4.8	18.38	33.21	26.30		173
10	4.62	18.38	33.21	26.36	0.017	172
25	3.19	18.39	33.22	26.48	0.042	160
50	1.14	18.40	33.24	26.65	0.079	140
75	0.76	18.41	33.26	26.67	0.114	136
100	0.66	18.40	33.24	26.67	0.149	136
150	0.63	18.45	33.33	26.73	0.217	130
200	0.63	18.46	33.35	26.77	0.283	126
300	3.55	18.76	33.89	26.97	0.404	110
400	3.50	18.84	34.04	27.09	0.512	98
500	3.42	18.90	34.14	27.19	0.609	89
600	3.34	18.96	34.25	27.27	0.699	81
800	3.10	19.01	34.34	27.36	0.863	71
1000	2.76	19.04	34.40	27.44	1.011	65
1200	2.53	19.08	34.47	27.53	1.146	58
1500	2.20	19.12	34.54	27.61	1.331	49

St. Oa 12 | Date 07-05 | Time 0305-0425 | Lat. N59-00 | Long. E170-00

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		4.7	18.24	32.95	8.07	111
10	2	4.57	18.26	32.99	8.00	109
25	〃	2.93	18.35	33.15	8.49	112
50	〃	1.10	18.36	33.21	6.58	83
75	〃	0.73	18.43	33.30	7.92	99
99	6	0.70	18.44	33.31	7.92	99
149	〃	0.70	18.47	33.37	7.75	97
199	〃	0.81	18.48	33.39	7.71	97
287	12	3.29	18.69	33.77	3.05	41
386	〃	3.54	18.82	34.00	1.44	19
485	〃	3.43	18.87	34.09	1.34	17
584	〃	3.36	18.95	34.23	1.22	16
784	〃	3.15	19.00	34.33	1.14	15
984	〃	2.96	19.02	34.36	1.03	14

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	4.7	18.24	32.96	26.13		191
10	4.57	18.26	32.99	26.15	0.019	189
25	2.93	18.35	33.15	26.44	0.045	160
50	1.10	18.38	33.21	26.62	0.083	143
75	0.73	18.43	33.30	26.71	0.118	135
100	0.70	18.44	33.31	26.73	0.152	133
150	0.70	18.47	33.37	26.77	0.218	129
200	0.82	18.48	33.39	26.76	0.282	130
300	3.35	18.71	33.80	26.92	0.405	115
400	3.53	18.83	34.02	27.06	0.518	99
500	3.42	18.88	34.11	27.16	0.614	92
600	3.34	18.96	34.25	27.27	0.705	81
800	3.12	19.00	34.33	27.36	0.869	73
1000	2.94	19.03	34.36	27.40	1.022	69

Table 18. (Continued)

St. Oa 13 | Date 07-06 | Time 0130-0305 | Lat. N56-30 | Long. E178-15

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.6	18.19	32.86	7.98	111
10	4	5.39	18.20	32.88	8.25	151
25	〃	3.26	18.41	33.26	8.37	111
50	〃	1.80	18.40	33.24	6.14	78
75	〃	1.61	18.45	33.33	7.12	91
98	10	1.46	18.48	33.39	7.05	90
148	〃	1.14	18.47	33.37	7.19	91
197	〃	1.06	18.54	33.49	6.36	82
276	21	3.05	18.80	33.96	2.14	29
370	〃	3.57	18.67	34.09	1.15	15
464	〃	3.43	18.90	34.14	0.98	13
564	〃	3.35	18.99	34.31	1.01	14
754	〃	3.31	19.09	34.40	0.95	13
942	〃	3.54	19.10	34.51	0.79	11
1170	〃	2.98	19.11	34.52	0.71	9
1460	〃	3.23	19.19	34.67	1.06	14

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.6	18.19	32.86	25.93		209
10	5.38	18.20	32.88	25.96	0.021	204
25	3.25	18.41	33.26	26.49	0.048	156
50	1.80	18.40	33.24	26.62	0.085	143
75	1.61	18.45	33.33	26.69	0.120	136
100	1.46	18.48	33.39	26.74	0.154	132
150	1.15	18.47	33.37	26.74	0.220	132
200	1.71	18.55	33.51	26.83	0.284	123
300	3.70	18.83	34.02	27.06	0.396	101
400	3.51	18.86	34.11	27.15	0.496	93
500	3.40	18.98	34.20	27.23	0.591	85
600	3.30	19.02	34.26	27.27	0.674	72
800	3.08	19.08	34.42	27.49	0.816	61
1000	2.77	19.10	34.51	27.58	0.945	57
1200	2.52	19.13	34.54	27.69	1.065	51
1500	2.19	19.20	34.69	27.73	1.234	39

St. Oa 15 | Date 07-07 | Time 0637-1002 | Lat. N56-10 | Long. E179-17

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.4	18.46	33.33	7.98	111
10	18	5.34	18.41	33.26	8.06	112
24	〃	4.14	18.45	33.33	8.16	111
48	〃	3.67	18.45	33.33	6.67	90
72	〃	2.54	18.46	33.33	8.04	105
98	23	3.05	18.47	33.37	7.89	102
198	〃	1.71	18.48	33.39	7.53	97
184	〃	3.36	18.65	33.69	4.99	67
276	29	3.71	18.64	34.04	1.59	21
368	〃	3.61	18.89	34.13	1.22	16
460	〃	3.62	18.95	34.23	0.94	12
554	〃	3.83	19.00	34.33	1.26	17
740	〃	3.71	19.08	34.47	2.15	29
929	〃	2.98	19.07	34.45	0.93	12
1130	34	2.70	19.14	34.58	1.35	18
1400	〃	2.39	19.12	34.54	1.06	14

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.4	18.45	33.33	26.33		171
10	5.34	18.41	33.26	26.39	0.017	174
25	4.11	18.45	33.33	26.47	0.042	167
50	3.60	18.45	33.33	26.62	0.081	153
75	2.44	18.45	33.33	26.62	0.118	143
100	1.93	18.48	33.39	26.71	0.153	136
150	2.10	18.49	33.40	26.71	0.221	136
200	3.05	18.69	33.77	26.86	0.285	120
300	3.69	18.86	34.07	27.10	0.396	98
400	3.58	18.93	34.20	27.21	0.491	87
500	3.46	18.99	34.31	27.31	0.577	78
600	3.34	19.01	34.34	27.35	0.657	74
800	3.14	19.07	34.45	27.45	0.808	64
1000	2.88	19.08	34.47	27.50	0.941	60
1300	2.59	19.14	34.58	27.61	1.088	49
1600	2.39	19.12	34.54	27.61	1.251	49

St. Oa 14 | Date 07-06 | Time 1940-2005 | Lat. N56-54 | Long. E179-17

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		4.9	18.43	33.30	7.90	109
10	6	4.02	18.43	33.28	8.14	112
25	〃	4.34	18.46	33.35	8.30	113
50	〃	3.46	18.46	33.35	6.43	86
75	〃	3.44	18.46	33.35	7.74	103
100	3	1.89	18.49	33.40	7.79	100
150	〃	1.54	18.48	33.39	7.55	97
200	〃	2.45	18.59	33.58	5.16	68
299	18	3.71	18.87	34.09	1.60	20
377	〃	3.77	18.86	34.11	0.99	13
470	〃	3.67	19.05	34.42	0.96	13
567	〃	3.39	19.05	34.42	1.19	16
758	〃	3.30	19.05	34.42	1.71	23
948	〃	2.98	19.15	34.60	0.96	13
1118	36	2.67	19.14	34.58	0.25	34
1408	〃	2.31	19.14	34.58	0.97	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	4.9	18.43	33.30	26.35		169
10	4.02	18.43	33.28	26.34	0.017	170
25	4.34	18.46	33.35	26.46	0.042	156
50	3.45	18.46	33.35	26.56	0.081	130
75	3.44	18.46	33.35	26.55	0.119	130
100	1.89	18.49	33.40	26.72	0.155	124
150	1.54	18.48	33.39	26.72	0.222	132
200	2.45	18.59	33.58	26.83	0.286	123
300	3.75	18.86	34.11	27.13	0.397	99
400	3.69	18.91	34.16	27.17	0.499	91
500	3.45	19.05	34.42	27.39	0.577	70
600	3.37	19.05	34.42	27.40	0.651	69
800	3.13	19.08	34.47	27.47	0.788	62
1000	2.85	19.15	34.60	27.60	0.916	50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	49
1600	2.19	19.14	34.58	27.64	1.196	46

St. Oa 16 07-07—08 | Time 2230-0008 | Lat. N53-35 | Long. E178-38

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 %
0		5.2	18.42	33.28	7.86	110
9	26	5.02	18.40	33.24	7.92	110
23	〃	5.08	18.40	33.24	7.90	111
45	〃	4.16	18.41	33.26	6.91	96
68	〃	4.35	18.41	33.26	7.59	105
91	37	2.72	18.46	33.35	7.43	98
136	〃	2.71	18.80	33.42	6.75	89
176	〃	3.33	18.89	33.56	5.20	69
242	34	3.62	18.75	33.87	3.21	43
338	〃	3.86	18.80	33.96	1.94	26
411	〃	3.80	18.90	34.14	1.03	14
494	〃	3.95	18.95	34.23	1.16	16
675	48	3.38	19.00	34.33	0.85	12
852	〃	3.04	19.05	34.42	0.67	9
1051	〃	2.87	19.10	34.51	1.30	17
1286	〃	2.64	19.14	34.58	0.82	11

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	$\Delta\sigma_t$
0	5.2	18.42	33.28	26.31		172
10	5.01	18.40	33.24	26.29	0.017	174
25	5.05	18.40	33.24	26.28	0.044	169
50	4.13	18.41	33.26	26.41	0.087	169
75	3.70	18.43	33.30	26.46	0.127	156
100	2.60	18.48	33.39	26.66	0.164	139
150	2.65	18.54	33.48	26.69	0.233	136
200	3.09	18.65	33.69	26.81	0.301	125
300	3.60	18.76	33.89	26.99	0.424	108
400	3.59	18.86	34.11	27.14	0.528	94
500	3.54	18.95	34.23	27.24	0.621	84
600	3.43	18.96	34.25	27.29	0.707	80
800	3.16	19.08	34.39	27.45	0.866	69
1000	2.89	19.09	34.49	27.55	1.007	60
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1600	(2.39)	(19.16)	(34.61)	(27.65)	(1.394)	(46)

Table 18. (Continued)

St. Os 17 | Date 07-08 | Time 0830-0745 | Lat. N63-10 | Long. E175-04

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.2	18.43	33.30	7.91	110
9	21	5.09	18.43	33.30	7.86	109
22	"	5.02	18.41	33.26	7.79	108
47	"	4.34	18.44	33.31	6.82	88
70	"	3.16	18.46	33.36	7.66	100
97	30	2.86	18.46	33.35	7.38	96
120	"	2.66	18.50	33.42	7.18	94
173	"	3.34	18.64	33.66	4.90	66
245	41	3.61	18.73	33.84	3.19	42
339	"	3.69	18.87	34.09	1.57	21
416	"	3.63	18.89	34.13	1.26	17
504	"	3.58	18.99	34.31	1.05	14
686	"	3.36	18.97	34.27	0.67	9
865	"	3.13	19.07	34.45	0.85	11
1073	47	2.84	19.10	34.51	0.75	10
1353	"	2.43	19.18	34.65	1.29	17

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.2	18.43	33.30	26.32		172
10	5.08	18.43	33.30	26.34	0.017	170
25	4.99	18.41	33.26	26.32	0.038	172
50	4.18	18.46	33.33	26.46	0.079	158
75	3.08	18.46	33.35	26.59	0.117	146
100	2.73	18.47	33.37	26.63	0.153	142
150	2.62	18.53	33.47	26.77	0.221	129
200	3.56	18.68	33.75	26.96	0.284	120
300	3.60	18.82	34.00	27.05	0.397	102
400	3.62	18.89	34.13	27.15	0.497	93
500	3.58	18.99	34.31	27.30	0.586	79
600	3.49	18.98	34.31	27.31	0.668	78
800	3.32	19.01	34.34	27.36	0.822	73
1000	2.95	19.09	34.49	27.50	0.974	80
1200	2.65	19.13	34.56	27.58	1.097	82
1500	2.22	19.20	34.69	(27.73)	(1.253)	(80)

St. Os 18 | Date 07-08 | Time 1550-1734 | Lat. N52-50 | Long. E176-56

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.1	18.40	33.24	7.73	107
9	28	5.00	18.38	33.21	7.88	109
22	"	4.98	18.40	33.24	7.91	109
44	"	4.65	18.43	33.30	6.31	87
65	30	3.71	18.44	33.31	3.58	56
88	37	3.39	18.46	33.35	7.00	98
132	"	2.70	18.52	33.46	6.53	86
177	"	3.33	18.63	33.65	4.70	63
196	58	3.54	18.69	33.77	3.90	52
284	"	3.63	18.82	34.00	2.45	33
347	"	3.62	18.85	34.05	2.29	31
422	"	3.62	18.96	34.25	1.78	24
572	"	3.52	18.96	34.25	1.13	15
765	"	3.27	19.04	34.40	0.96	13
1080	60	2.86	19.10	34.51	0.93	12
1331	"	2.45	19.13	34.56	1.53	20

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.1	18.40	33.24	26.29		174
10	4.99	18.38	33.21	26.29	0.017	175
25	4.95	18.41	33.26	26.32	0.043	172
50	4.40	18.43	33.30	26.41	0.086	163
75	3.53	18.45	33.33	26.53	0.124	152
100	3.15	18.46	33.39	26.61	0.161	144
150	2.72	18.55	33.51	26.75	0.230	131
200	3.55	18.70	33.78	26.99	0.298	117
300	3.63	18.83	34.02	27.07	0.404	100
400	3.62	18.88	34.20	27.21	0.501	87
500	3.58	18.96	34.25	27.28	0.590	80
600	3.50	18.97	34.27	27.28	0.676	80
800	3.21	19.05	34.43	27.48	0.834	67
1000	2.91	19.09	34.49	27.50	0.973	69
1200	2.65	19.12	34.54	27.57	1.099	68
1400	(2.25)	(19.15)	(34.60)	(27.65)	(1.239)	(65)

St. Os 19 | Date 07-09 | Time 0110-0210 | Lat. N52-28 | Long. E178-40

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.3	18.41	33.26	7.49	104
9	26	5.07	18.40	33.24	7.57	105
22	"	5.10	18.41	33.26	7.59	105
45	"	4.56	18.45	33.33	6.35	86
67	"	3.31	18.45	33.33	7.49	100
88	35	2.86	18.48	33.39	7.41	98
128	"	2.91	18.53	33.48	6.91	91
171	"	3.12	18.57	33.55	5.76	76
213	54	3.69	18.75	33.87	3.04	47
290	"	3.63	18.86	34.05	1.98	31
443	"	3.51	18.93	34.20	1.47	20
726	"	3.22	19.05	34.42	0.88	9
1312	"	2.54	19.13	34.56	0.86	11

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.3	18.41	33.26	26.28		175
10	5.06	18.40	33.24	26.29	0.018	181
25	5.11	18.41	33.26	26.30	0.046	178
50	4.31	18.46	33.35	26.47	0.087	167
75	3.01	18.48	33.36	26.59	0.125	146
100	2.80	18.50	33.42	26.67	0.160	138
150	3.01	18.55	33.51	26.72	0.228	134
200	3.54	18.69	33.77	26.97	0.292	119
300	3.61	18.85	34.07	27.10	0.408	93
400	3.53	18.99	34.14	27.17	0.500	91
500	3.47	18.96	34.25	27.26	0.589	80
600	3.35	19.00	34.33	27.32	0.671	76
800	3.14	19.07	34.45	27.45	0.821	64
1000	2.84	19.10	34.51	27.50	0.964	57
1200	2.56	19.11	34.52	27.56	1.140	54

St. Os 20 | Date 07-09 | Time 1136-1365 | Lat. N52-30 | Long. W178-54

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.6	18.46	33.39	7.35	103
8	32	5.46	18.38	33.21	7.51	105
21	"	5.46	18.38	33.21	7.46	105
42	"	4.41	18.43	33.30	5.54	76
64	"	3.58	18.43	33.30	5.62	79
86	"	4.18	18.45	33.33	8.02	109
133	39	3.55	18.48	33.39	6.64	92
173	"	3.15	18.47	33.37	6.56	87
269	56	3.42	18.63	33.66	5.85	74
274	"	3.60	18.67	33.73	4.11	55
419	"	3.69	18.84	34.04	3.40	46
740	"	3.30	19.00	34.33	0.94	13
1205	"	2.66	19.11	34.52	1.51	20

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	5.6	18.46	33.40	26.36		169
10	5.44	18.38	33.21	26.22	0.018	181
25	5.39	18.39	33.22	26.25	0.045	178
50	4.10	18.43	33.30	26.44	0.087	160
75	4.00	18.44	33.31	26.47	0.127	157
100	4.19	18.47	33.37	26.49	0.166	155
150	3.39	18.47	33.37	26.65	0.242	147
200	3.19	18.69	33.65	26.76	0.312	130
300	3.73	18.70	33.76	26.87	0.439	119
400	3.71	18.82	34.00	27.04	0.553	109
500	3.58	18.90	34.14	27.17	0.654	91
600	3.43	18.96	34.25	27.26	0.745	82
800	3.22	19.02	34.38	27.37	0.910	72
1000	2.97	19.07	34.45	27.47	1.067	62
1200	2.65	19.11	34.52	27.55	1.188	55

Table 18. (Continued)

St. Oa 21 | Date 07-10 | Time 0455-0718 | Lat. N53-14 | Long. E176-40

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.9	18.42	33.28	7.32	103
10	12	5.86	18.40	33.24	7.34	103
24	"	5.36	18.41	33.26	7.35	103
49	"	4.38	18.44	33.31	6.00	82
73	"	3.16	18.46	33.30	6.54	87
96	17	3.11	18.51	33.44	6.19	82
147	12	3.02	18.50	33.42	4.74	63
191	17	3.52	18.62	33.64	3.86	52
286	31	3.71	18.75	33.87	1.87	25
379	18	3.65	18.68	34.11	1.10	15
480	31	3.51	18.92	34.18	0.82	11
581	"	3.46	18.96	34.25	0.95	13
723	"	3.27	19.04	34.40	0.62	8
918	"	2.93	19.07	34.45	0.76	10
1136	18	2.65	19.10	34.51	0.79	10
1438	"	2.30	19.14	34.58	1.02	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	5.9	18.42	33.28	25.22		181
10	5.86	18.40	33.24	25.24	0.018	179
25	5.35	18.41	33.26	25.27	0.045	176
50	4.32	18.44	33.31	25.44	0.087	160
75	3.13	18.49	33.40	25.62	0.125	143
100	3.10	18.51	33.44	25.65	0.161	140
150	3.02	18.50	33.42	25.65	0.232	140
200	3.53	18.64	33.63	25.80	0.299	125
300	3.72	18.80	33.96	27.01	0.417	106
400	3.60	18.89	34.13	27.17	0.518	91
500	3.48	18.94	34.22	27.23	0.610	85
600	3.40	18.99	34.31	27.32	0.695	77
800	3.13	19.06	34.43	27.44	0.847	65
1000	2.82	19.08	34.47	27.50	0.984	60
1200	2.57	19.11	34.52	27.56	1.111	54
1500	2.20	19.15	34.60	27.65	1.283	45

St. Oa 23 | Date 07-11 | Time 0020-0152 | Lat. N53-03 | Long. W178-52

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.6	18.36	33.21	7.44	107
10	7	5.60	18.36	33.17	7.37	105
25	"	5.51	18.36	33.17	7.33	105
50	"	4.50	18.43	33.30	5.30	72
74	"	4.11	18.47	33.37	6.03	82
96	15	4.07	18.48	33.39	5.50	75
144	"	3.94	18.48	33.39	4.93	67
187	"	3.68	18.53	33.48	5.31	71
280	24	3.71	18.73	33.84	3.68	49
376	"	3.74			2.04	—
473	"	3.67	18.87	34.09	1.69	23
570	"	3.61	18.94	34.22	1.25	17
763	"	3.36	19.00	34.33	0.95	12
955	"	3.04	19.05	34.42	1.03	14
1170	20	2.79	19.08	34.49	0.71	9
1466	"	2.39	19.14	34.58	0.99	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.6	18.38	33.21	25.08		194
10	5.60	18.36	33.17	25.18	0.019	185
25	5.51	18.36	33.17	25.21	0.047	182
50	4.50	18.43	33.30	25.40	0.090	164
75	4.10	18.47	33.37	25.50	0.130	154
100	4.06	18.48	33.39	25.52	0.169	153
150	3.92	18.48	33.39	25.54	0.246	151
200	3.65	18.56	33.53	25.67	0.318	138
300	3.72	18.78	33.93	26.96	0.444	109
400	3.73	18.84	34.04	27.06	0.552	101
500	3.65	18.86	34.11	27.13	0.754	95
600	3.58	18.96	34.23	27.24	0.848	84
800	3.30	19.01	34.34	27.36	1.016	73
1000	2.98	19.06	34.43	27.46	1.165	63
1200	2.75	19.10	34.51	27.54	1.295	56
1500	2.34	19.15	34.60	27.64	1.474	46

St. Oa 22 | Date 07-10 | Time 1220-1338 | Lat. N53-54 | Long. E178-40

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.4	18.38	33.21	7.39	103
10	10	5.30	18.37	33.19	7.61	106
25	"	5.10	18.36	33.21	7.54	105
49	"	4.16	18.43	33.30	5.13	70
73	13	2.81	18.46	33.35	7.53	99
96	18	2.69	18.46	33.35	7.09	93
143	"	2.19	18.82	33.46	6.76	86
190	"	3.58	18.66	33.71	3.61	47
281	31	3.76	18.80	33.96	2.00	27
381	"	3.60	18.88	34.11	1.36	17
441	"	3.46	18.98	34.30	1.11	15
590	"	3.41	18.97	34.27	1.12	15
716	"	3.30	19.00	34.33	0.39	5
838	"	2.98	19.10	34.51	0.68	8
1101	36	2.70	19.10	34.51	0.80	11
1367	"	2.38	19.17	34.63	1.00	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	5.4	18.38	33.21	26.23		180
10	5.30	18.37	33.19	26.23	0.018	180
25	5.10	18.36	33.21	26.25	0.045	177
50	4.10	18.43	33.30	26.44	0.087	160
75	2.79	18.46	33.36	26.61	0.125	144
100	2.69	18.46	33.35	26.63	0.161	142
150	2.30	18.54	33.49	26.77	0.229	130
200	3.69	18.69	33.77	26.95	0.292	120
300	3.69	18.84	34.04	27.07	0.405	109
400	3.63	18.86	34.05	27.07	0.503	99
500	3.63	18.96	34.25	27.27	0.592	81
600	3.38	18.98	34.29	27.30	0.676	79
800	3.30	19.05	34.40	27.43	0.832	67
1000	2.85	19.10	34.51	27.53	0.980	57
1200	2.58	19.12	34.54	27.56	1.080	52
1500	(2.14)	(19.30)	(34.69)	(27.72)	(1.248)	(39)

St. Oa 24 | Date 07-11 | Time 0720-0900 | Lat. N53-50 | Long. W178-52

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.4	18.43	33.30	7.39	104
10	0	5.61	18.42	33.28	7.42	104
25	"	5.50	18.39	33.22	7.45	104
50	"	5.23	18.38	33.21	6.10	85
75	"	3.97	18.48	33.39	6.38	85
100	3	3.49	18.46	33.38	6.80	87
150	"	3.45	18.52	33.46	5.83	78
200	"	3.13	18.53	33.46	6.03	80
297	9	3.80	18.71	33.80	3.31	43
397	"	3.89	18.85	34.05	1.89	26
497	"	3.82	18.90	34.14	1.71	23
594	"	3.46	19.00	34.33	1.09	15
777	"	3.32	19.04	34.40	0.66	9
959	"	2.96	19.07	34.47	0.79	11
1196	10				0.64	—
1474	"	2.36	19.14	34.58	0.96	13

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.4	18.43	33.30	26.17		186
10	5.61	18.42	33.28	26.25	0.018	177
25	5.50	18.39	33.22	26.24	0.045	179
50	5.23	18.38	33.21	26.25	0.090	176
75	3.97	18.48	33.39	26.54	0.131	151
100	3.49	18.48	33.39	26.56	0.168	147
150	3.45	18.52	33.46	26.63	0.241	142
200	3.13	18.52	33.46	26.66	0.313	139
300	3.82	18.72	33.82	26.89	0.442	117
400	3.68	18.85	34.05	27.05	0.553	99
500	3.61	18.89	34.14	27.18	0.653	90
600	3.46	19.01	34.34	27.34	0.742	75
800	3.21	19.04	34.40	27.41	0.888	68
1000	2.97	19.07	34.46	27.47	1.036	62
1200	2.67	19.10	34.51	27.54	1.168	56
1500	2.35	19.14	34.58	27.63	1.345	47

Tadel 18. (Continued)

St. Oc 26 | Date 07-11 | Time 2030-2142 | Lat. N56-34 | Long. W176-48

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.8	18.34	33.13	7.39	104
9	25	6.50	18.39	33.19	7.25	101
23	"	6.40	18.38	33.12	7.24	101
46	"	4.46	18.43	33.30	6.85	85
68	"	3.65	18.49	33.40	6.74	80
77	40	3.45	18.44	33.31	6.80	80
134	"	2.84	18.44	33.31	6.90	81
177	"	2.49	18.44	33.31	7.44	87
221	48	3.07	18.62	33.64	5.97	71
285	"	3.64	18.76	33.89	3.78	37
386	"	3.44	18.92	34.16	1.99	27
467	"	3.59	18.91	34.16	1.38	19
628	"	3.31	18.99	34.31	0.82	11
816	"	3.08	19.10	34.51	1.21	16
1088	52	2.80	19.12	34.54	0.81	11
1339	"	2.45	19.15	34.61	0.86	11

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.5	18.34	33.13	25.99		203
10	6.48	18.32	33.10	26.00	0.020	202
25	6.36	18.33	33.12	26.04	0.060	198
50	4.25	18.44	33.31	26.44	0.086	160
75	3.50	18.44	33.31	26.52	0.134	152
100	3.07	18.48	33.39	26.54	0.172	151
150	2.60	18.44	33.31	26.60	0.245	145
200	2.65	18.50	33.42	26.68	0.311	137
300	3.68	18.75	33.87	26.95	0.443	112
400	3.65	18.92	34.18	27.20	0.546	86
500	3.50	18.92	34.18	27.21	0.637	87
600	3.34	18.97	34.27	27.29	0.725	80
800	3.09	19.09	34.49	27.49	0.875	61
1000	2.87	19.12	34.54	27.56	1.062	54
1200	2.68	19.14	34.58	27.61	1.119	49
1400	2.21	19.17	34.68	(27.68)	(1.278)	(45)

St. Oc 27 | Date 07-12 | Time 2010-2315 | Lat. N58-49 | Long. W178-43

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.9	18.26	32.99	8.79	118
8	34	6.77	18.33	33.12	8.36	120
21	"	6.78	18.27	33.01	8.44	121
42	"	2.44	18.33	33.12	6.21	81
62	52	2.30	18.33	33.12	7.54	98
106	"	2.96	18.34	33.13	7.49	97
141	"	2.12	18.37	33.19	7.44	96
169	59	2.80	18.39	33.23	6.67	87
240	"	3.56	18.54	33 49	4.67	63
302	"	3.02	18.53	33.48	5.42	72
361	"	3.74	18.63	33.66	3.55	48
478	"	3.71	18.74	33.85	2.37	32
625	71	3.58	18.85	34.05	1.24	17
799	"	3.23	18.98	34.20	1.02	14
1063	"	2.91	19.02	34.36	0.66	9

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.9	18.26	32.99	25.87		214
10	6.75	18.33	33.12	25.99	0.021	203
25	6.70	18.36	32.99	25.90	0.052	211
50	2.37	18.33	33.12	26.46	0.098	158
75	2.19	18.38	33.12	26.47	0.138	157
100	2.08	18.34	33.13	26.49	0.177	155
150	2.23	18.37	33.19	26.53	0.254	152
200	3.13	18.45	33.33	26.56	0.329	149
300	3.04	18.53	33.48	26.69	0.473	136
400	3.73	18.68	33.75	26.84	0.605	122
500	3.68	18.76	33.89	26.96	0.725	111
600	3.56	18.84	34.04	27.08	0.836	99
800	3.23	18.93	34.20	27.25	1.026	83
1000	2.99	19.01	34.34	27.39	1.194	70
1260	(2.71)	(19.05)	(34.42)	(27.46)	(1.348)	(63)

St. Oc 25 | Date 07-12 | Time 0715-0842 | Lat. N57-00 | Long. W178-58

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.7	18.35	33.15	7.49	107
10	4	6.74	18.33	33.12	7.49	108
25	"	5.86	18.38	33.21	7.82	110
50	"	3.46	18.43	33.30	6.63	88
75	"	3.31	18.43	33.30	7.72	103
96	16	3.36	18.47	33.37	7.17	96
146	"	1.67	18.45	33.33	7.39	97
196	"	2.42	18.55	33.51	6.05	79
286	24	3.08	18.65	34.06	2.12	29
382	"	3.55	18.65	34.06	1.48	20
480	"	3.42	18.68	34.09	1.29	17
575	"	3.31	18.68	34.09	0.92	12
772	"	3.14	19.01	34.34	0.61	8
972	"	2.85	19.08	34.43	0.60	8
1179	12	2.61	19.12	34.54	0.80	11
1466	"	2.38	19.14	34.58	1.08	14

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.7	18.36	33.15	26.03		199
10	6.74	18.36	33.12	25.99	0.020	203
25	5.86	18.38	33.21	26.17	0.049	186
50	3.46	18.43	33.30	26.50	0.092	154
75	3.31	18.43	33.30	26.52	0.131	153
100	2.24	18.47	33.37	26.67	0.167	138
150	1.67	18.45	33.33	26.68	0.236	137
200	2.56	18.56	33.53	26.77	0.302	129
300	3.70	18.86	34.07	27.10	0.428	96
400	3.62	18.86	34.07	27.12	0.538	96
500	3.49	18.94	34.22	27.24	0.642	84
600	3.29	18.99	34.31	27.33	0.736	76
800	3.11	19.01	34.34	27.38	0.913	71
1000	2.91	19.07	34.45	27.48	1.076	62
1200	2.69	19.12	34.54	27.55	1.195	52
1540	2.24	19.14	34.58	27.64	1.356	46

St. Oc 28 | Date 07-14 | Time 2205-2230 | Lat. N57-16 | Long. W171-50

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.3	18.03	32.57	7.40	105
10	18	6.15	17.19	32.36	7.60	106
24	"	5.98	17.90	32.34	7.49	105
46	"	4.84	18.08	32.66	6.08	84
71	"	2.78	18.20	32.86	6.31	91
96	"	2.42	18.23	32.94	6.00	78

Intetpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.3	18.03	32.57	25.83		224
10	6.15	17.91	32.36	25.67	0.025	262
25	5.94	17.90	32.34	25.68	0.063	251
50	4.80	18.09	32.66	26.06	0.121	213
75	2.62	18.21	32.90	26.26	0.170	177
100	2.36	18.24	32.96	26.33	0.213	171

Table 18. (Continued)

St. Oa 29 | Date 07-15 | Time 0445-0505 | Lat. N57-27 | Long. W170-11

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.8	17.69	32.32	7.98	111
10	8	5.54	17.85	32.35	7.96	111
25	"	4.35	17.98	32.39	8.56	116
50	"	3.01	17.99	32.50	6.17	81

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	5.8	17.69	32.32	25.49		250
10	5.54	17.85	32.35	25.46	0.085	253
25	4.35	17.93	32.39	25.71	0.081	229
50	3.01	17.99	32.50	25.91	0.116	216

St. Oa 32 | Date 07-16 | Time 1600-1700 | Lat. N57-16 | Long. W161-40

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.0	17.60	31.80	7.53	103
10	0	4.86	17.61	31.82	7.71	105
25	"	4.26	17.64	31.87	7.66	103
50	"	4.24	17.64	31.87	6.34	86

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	5.0	17.60	31.80	25.17		281
10	4.86	17.61	31.82	25.19	0.028	279
25	4.26	17.64	31.87	25.30	0.069	268
50	4.24	17.64	31.87	25.30	0.136	268

St. Oa 30 | Date 07-15 | Time 1730-1735 | Lat. N57-26 | Long. W169-06

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		5.8	17.80	32.16	7.87	107
10	7	5.65	17.82	32.20	7.70	106
25	"	4.35	17.82	32.30	7.86	102
50	"	2.45	17.90	32.34	5.96	77

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	5.8	17.80	32.16	25.38		263
10	5.65	17.82	32.20	25.41	0.026	256
25	4.35	17.82	32.30	25.55	0.084	245
50	2.45	17.90	32.34	25.83	0.122	216

St. Oa 33 | Date 07-20 | Time 0845-0715 | Lat. N56-04 | Long. W168-15

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		8.2	17.68	31.76	7.88	112
10	5	7.67	17.89	31.76	7.83	109
25	"	6.47	17.86	31.91	7.34	104
50	"	3.83	17.80	32.16	4.84	65
75	"	3.62	17.79	32.14	5.87	78

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	8.2	17.68	31.76	24.73		323
10	7.67	17.89	31.76	24.81	0.032	315
25	6.47	17.86	31.91	25.06	0.077	289
50	3.83	17.80	32.16	25.57	0.144	243
75	3.62	17.79	32.14	25.57	0.204	243

St. Oa 31 | Date 07-16 | Time 0650-0815 | Lat. N57-23 | Long. W163-58

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		6.0	17.65	31.89	7.73	108
10	8	5.84	17.86	31.91	8.17	114
25	"	4.60	17.75	32.07	7.25	99
50	"	3.16	17.77	32.10	5.97	78

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	6.0	17.65	31.89	25.12		288
10	5.84	17.86	31.91	25.16	0.033	282
25	4.60	17.75	32.07	25.42	0.088	257
50	3.16	17.77	32.10	25.69	0.130	242

St. Oa 34 | Date 07-20 | Time 2040-2115 | Lat. N54-45 | Long. W165-19

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		7.8	18.05	32.61	7.43	109
10	9	6.45	18.07	32.65	7.35	105
25	"	6.33	18.06	32.63	7.40	106
50	"	5.39	18.10	32.70	5.64	79
74	"	5.35	18.12	32.74	6.77	94
97	14	5.40	18.11	32.72	6.55	91
147	"	5.04	18.20	32.85	6.72	93

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σ_t	ΔD	Δst
0	7.8	18.05	32.61	25.45		254
10	6.45	18.07	32.65	25.48	0.034	254
25	6.33	18.06	32.63	25.47	0.069	232
50	5.39	18.10	32.70	25.58	0.116	210
75	5.37	18.12	32.74	25.61	0.170	215
100	5.40	18.11	32.72	25.61	0.194	215
120	5.02	18.21	32.80	25.68	0.196	169

Table 18. (Continued)

St.	Date	Time	Lat.	Long.
Oa 35	07-21	0850-1050	N53-40	W163-31

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		9.8	17.86	31.91	7.08	106
10	9	9.06	17.61	31.82	7.32	110
25	"	8.76	17.89	32.32	7.12	106
49	"	6.07	18.09	32.68	5.52	78
74	"	5.00	18.28	33.03	5.93	82
100	4	4.92	18.46	33.35	4.34	60
150	"	5.06	18.69	33.77	2.62	36
200	"	4.72	18.75	33.87	1.81	25
293	5	4.88	18.83	34.02	1.09	15
386	"	3.97	18.88	34.11	0.54	7
496	"	3.78	18.93	34.20	0.78	10
596	"	3.62	18.96	34.25	0.67	9
794	"	3.37	19.01	34.34	0.53	7
990	7	3.07	19.07	34.45	0.76	10
1188	"	2.68	19.10	34.51	0.94	12
1482	"	2.21	19.12	34.54	1.09	14

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	9.8	17.86	31.91	24.60		
10	9.06	17.61	31.82	24.64	0.092	331
25	8.76	17.89	32.32	25.08	0.264	289
50	6.00	18.10	32.70	25.76	0.344	225
75	4.99	18.29	33.04	26.15	0.198	188
100	4.92	18.46	33.35	26.40	0.240	164
150	5.06	18.69	33.77	26.71	0.315	135
200	4.72	18.75	33.87	26.84	0.330	122
300	4.37	18.83	34.02	26.99	0.458	108
400	3.96	18.88	34.11	27.10	0.534	98
500	3.77	18.93	34.20	27.19	0.701	89
600	3.61	18.96	34.25	27.25	0.782	83
800	3.36	19.01	34.34	27.35	0.980	74
1000	3.06	19.07	34.45	27.46	1.110	63
1200	2.60	19.10	34.51	27.55	1.242	55
1500	2.19	19.12	34.54	27.61	1.421	49

St.	Date	Time	Lat.	Long.
Oa 37	07-22	0130-0320	N52-15	W161-09

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		10.6	17.93	32.39	7.06	109
10	4	8.87	17.92	32.38	7.49	112
25	"	8.33	17.93	32.39	7.37	109
50	"	5.56	18.03	32.57	5.64	79
75	"	3.86	18.27	33.01	6.12	82
100	"	4.17	18.43	33.30	5.00	68
150	"	4.18	18.70	33.78	1.86	25
200	"	4.14	18.79	33.95	0.82	11
298	7	4.03	18.88	34.11	0.82	9
396	"	3.79	18.90	34.14	0.69	8
498	"	3.57	18.97	34.27	0.83	11
597	"	3.41	19.01	34.34	0.50	7
796	5	3.04	19.01	34.34	0.55	7
994	"	2.72	19.06	34.43	0.09	9
1198	"	2.44	19.07	34.45	0.96	12
1492	"	2.24	19.12	34.54	1.17	15

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	10.6	17.93	32.39	24.84		312
10	8.87	17.92	32.38	25.10	0.090	287
25	8.33	17.93	32.39	25.20	0.072	276
50	5.56	18.03	32.57	25.71	0.136	229
75	3.86	18.27	33.01	26.24	0.187	179
100	4.17	18.43	33.30	26.43	0.230	161
150	4.18	18.70	33.78	26.83	0.302	125
200	4.14	18.79	33.95	26.98	0.381	111
300	4.02	18.86	34.11	27.10	0.468	98
400	3.79	18.90	34.14	27.15	0.566	53
500	3.57	18.97	34.27	27.27	0.657	81
600	3.40	19.01	34.34	27.35	0.739	74
800	3.08	19.01	34.34	27.38	0.893	71
1000	2.71	19.06	34.43	27.48	1.037	62
1200	2.43	19.07	34.45	27.51	1.170	56
1500	2.28	19.12	34.54	27.61	1.353	49

St.	Date	Time	Lat.	Long.
Oa 36	07-21	1725-1900	N52-58	W162-19

Observed

Depth(m)	A(°)	T(°C)	Cl(‰)	S(‰)	O_2 (ml/L)	Sat. O_2 (%)
0		10.3	17.96	32.45	6.82	105
10	6	9.22	17.96	32.45	6.94	106
25	"	7.72	17.98	32.48	7.04	103
50	"	5.61	18.09	32.68	5.91	83
75	"	3.77	18.29	33.04	6.37	86
100	10	3.71	18.47	33.37	4.33	58
150	"	4.17	18.75	33.87	1.25	17
200	"	4.05	18.78	33.93	0.74	10
280	17	3.95	18.88	34.11	0.58	8
374	"	3.84	18.91	34.16	0.58	8
466	"	3.67	18.95	34.23	0.60	7
561	"	3.38	18.99	34.31	0.68	9
760	"	3.12	19.02	34.36	0.66	9
978	"	2.72	19.05	34.43	0.68	8
1175	"	2.37	19.07	34.45	0.77	10
1470	"	2.07	19.12	34.54	1.30	17

Interpolated

Depth(m)	T(°C)	Cl(‰)	S(‰)	σt	ΔD	Δst
0	10.3	17.96	32.45	24.93		304
10	9.22	17.96	32.45	25.11	0.090	285
25	7.72	17.98	32.48	25.36	0.071	263
50	5.61	18.09	32.68	25.79	0.128	222
75	3.77	18.29	33.04	26.26	0.182	175
100	3.71	18.47	33.37	26.54	0.223	151
150	4.17	18.75	33.87	26.90	0.290	117
200	4.05	18.78	33.93	26.95	0.348	112
300	3.93	18.89	34.13	27.12	0.464	96
400	3.77	18.92	34.18	27.18	0.550	90
500	3.47	18.97	34.27	27.28	0.639	80
600	3.31	19.00	34.33	27.34	0.721	75
800	3.05	19.03	34.38	27.41	0.874	68
1000	2.87	19.06	34.43	27.48	1.015	62
1200	2.33	19.07	34.45	27.52	1.148	58
1500	2.04	19.12	34.54	27.59	1.285	47

8. Data on Light Scattering by Suspended Matter
(懸濁物による光の散乱度測定)

The measurement was made by K. kato on the sample water by placing on a AKA phototube colorimeter aboard the ship. From the intensity of light scattered, the turbidity of sea water is calculated in Coleman's Nepheros Unit.

Table 19. Data on light scattering of water in 1955 cruise to the Bering Sea

Os 1		Os 2		Os 3		Os 4		Os 5		Os 6		Os 7	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0		0	5.0	0	5.2	0	4.0	0	5.1	0	5.4	0	7.9
10		10	3.2	10	7.3	10	6.9	10	3.2	10	5.8	10	4.7
25		24	3.2	25	5.0	24	5.3	25	5.0	25	5.8	25	7.8
50		49	4.0	50	6.9	49	6.3	50	3.4	50	8.3	50	5.6
75		73	3.6	75	2.9	73	6.3	75	4.4	75	3.2	75	3.5
100		91	3.4	100	5.0	99	3.6	99	3.4	100	4.1	100	5.8
150		118	5.9	150	4.8	148	3.0	149	3.0	150	4.4	150	5.8
200		158	4.2	200	4.2	197	3.3	197	3.2	200	4.0	200	3.9
295		220	27.9	296	15.1	274	13.5	282	2.9	295	3.3	292	4.2
393		294	32.6	391	13.1	360	10.7	376	10.1	394	12.3	392	12.4
488		369	8.2	490	8.9	455	4.2	472	8.1	493	6.5	492	4.3
583		448	6.2	585	24.7	549	29.1	567	3.7	592	4.6	591	6.8
780		620	4.5	780	5.0	744	12.7	750	13.4	790	9.2	785	8.3
970		803	12.3	977	14.4	956	14.7	938	4.0	988	22.1	990	24.7
1151		988	7.0	1174	4.9	1153	12.5	1149	3.5	1185	7.4	1184	6.6
1440		1270	9.5	1455	13.9	1447	14.3	1431	6.8	1482	6.1	1485	5.1

Table 19. (Continued)

Os 8		Os 9		Os 10		Os 11		Os 12		Os 13		Os 14	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0	6.5	0	8.2	0	7.9	0	7.5	0	15.3	0	20.4	0	6.2
10	4.8	10	7.2	10	4.8	9	4.8	10	8.6	10	5.4	10	5.4
25	6.1	22	9.4	25	5.5	23	7.0	25	6.6	25	4.6	25	7.6
50	6.1	44	6.3	50	7.0	46	10.8	50	6.3	50	3.2	50	3.9
75	8.2	66	9.3	75	7.7	69	7.7	75	5.7	75	4.7	75	2.5
98	7.1	78	9.7	99	8.2	71	7.3	99	5.3	98	4.0	100	3.1
147	7.3	125	7.0	150	7.3	106	6.6	149	4.1	148	3.7	150	3.7
197	10.3	174	5.0	200	6.6	136	7.4	199	5.1	197	4.8	200	2.1
295	8.9	237	4.8	269	4.4	220	6.3	287	4.8	278	4.2	279	3.0
394	4.1	250	11.5	365	7.5	290	6.7	383	9.4	370	4.9	377	4.8
493	4.0	317	7.8	460	10.3	367	10.3	455	7.5	464	5.4	470	4.6
593	6.3	380	6.6	555	13.2	448	8.2	584	4.5	554	4.2	567	3.6
792	11.1	519	12.4	740	10.6	610	8.9	784	6.8	754	4.1	753	5.0
980	7.2	703	7.4	935	19.3	800	15.1	984	10.3	942	8.1	940	8.2
1177	8.1	977	5.7	1162	8.7	1042	8.9			1170	8.7	1118	4.6
1472	5.5	1239	8.2	1456	17.2	1321	7.1			1460	4.2	1403	2.1
1989	6.8												

Table 19. (Continued)

Os 15		Os 16		Os 17		Os 18		Os 19		Os 20		Os 21	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0	17.6	0	12.0	0	9.0	0	9.1	0	6.5	0	7.3	0	10.8
10	10.8	9	4.2	9	6.4	9	13.9	9	6.0	8	8.2	10	5.6
24	14.8	23	6.4	23	6.1	22	6.6	22	5.8	21	11.4	24	7.4
48	4.8	45	5.0	47	6.4	44	4.2	45	6.8	42	5.4	49	4.0
72	4.4	68	4.5	70	6.3	65	3.7	67	9.8	64	3.9	73	6.6
92	3.9	81	4.2	87	5.7	88	5.3	82	5.5	85	2.9	95	4.0
138	9.1	128	3.7	130	5.7	132	6.8	128	5.4	133	3.7	147	3.2
184	4.6	176	4.9	173	6.4	177	9.8	171	4.6	172	3.8	191	3.3
276	6.1	242	4.5	245	3.7	195	4.6	213	4.6	259	4.8	266	4.8
369	6.6	328	5.5	329	11.9	284	4.2	290	4.6	273	4.1	373	6.8
480	3.5	418	4.1	416	6.1	347	4.0	443	5.1	419	3.9	450	5.9
554	5.3	494	4.7	504	6.9	422	5.3	735	13.2	740	5.3	541	4.1
749	5.4	675	4.8	686	6.5	572	6.7	1212	5.3	1205	4.5	723	4.0
939	4.6	862	2.8	865	5.0	765	3.1					918	5.8
1120	2.8	1051	3.8	1073	5.1	1050	6.1					1136	3.9
1400	4.0	1338	4.6	1353	4.5	1331	4.1					1428	2.7

Table 19. (Continued)

Os 22		Os 23		Os 24		Os 25		Os 26		Os 27		Os 28	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0	10.5	0	8.2	0	6.7	0	6.9	0	10.7	0	13.0	0	5.8
10	4.1	10	11.1	10	4.1	9	5.7	10	6.0	8	9.9	10	5.7
25	5.9	25	6.3	25	3.4	23	5.1	25	5.7	21	12.5	24	4.9
49	14.0	50	6.2	50	4.5	46	4.8	50	4.9	42	4.2	48	5.2
73	6.4	74	4.8	75	3.9	68	5.6	75	4.6	60	5.7	71	7.4
95	4.1	96	4.2	100	4.4	77	4.5	96	4.2	100	8.3	95	5.0
143	4.6	144	12.4	150	5.6	134	4.8	146	3.7	141	4.5		
190	4.5	187	6.7	200	4.5	177	5.7	196	6.6	169	5.0		
261	6.2	280	5.0	297	4.4	221	5.0	285	4.4	240	8.5		
351	4.1	376	5.1	397	4.2	305	3.8	382	3.7	303	5.9		
441	4.0	473	3.4	497	3.7	386	3.7	480	3.4	361	6.0		
530	3.4	570	2.9	594	4.6	467	6.4	575	4.9	476	5.8		
718	3.4	763	4.5	777	4.1	628	6.6	772	4.5	625	5.7		
903	3.3	955	4.4	939	4.1	818	6.0	972	4.8	799	8.4		
1101	2.9	1170	2.6	1196	4.4	1053	5.7	1179	4.1	1053	3.8		
1387	4.4	1465	5.0	1474	4.5	1329	4.2	1466	4.8				

Table 19. (Continued)

Os 29		Os 30		Os 31		Os 32		Os 33		Os 34		Os 35	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0	8.7	0	5.3	0	6.3	0	7.4	0	10.6	0	7.4	0	9.9
10	6.2	10	7.2	10	6.6	10	6.5	10	7.3	10	7.5	10	5.5
25	4.8	25	6.5	25	5.7	25	6.2	25	5.0	25	5.2	25	5.2
50	6.5	50	7.4	50	8.1	50	6.8	50	7.8	50	5.8	49	5.1
								75	8.5	74	6.1	74	5.3
										97	9.6	100	4.6
										147	5.1	150	6.5
												200	4.7
												298	5.0
												396	4.9
												496	5.3
												595	7.5
												794	6.9
												990	4.6
												1188	3.4
												1482	5.0

Table 19. (Continued)

Os 36		Os 37	
Depth (m)	Turbidity (C.N.U)	Depth (m)	Turbidity (C.N.U)
0	6.2	0	7.5
10	3.9	10	5.7
25	3.7	25	5.0
50	4.3	50	5.7
75	4.5	75	4.1
100	4.8	100	4.9
150	3.5	150	10.9
200	5.2	200	6.9
280	11.1	298	4.1
374	4.1	398	3.4
465	6.8	498	4.6
565	6.3	597	6.2
750	12.5	796	2.8
978	2.8	994	4.5
1175	4.9	1193	2.9
1470	3.9	1492	8.7

9. Data on Light Absorption of Sea Water *in situ*

（現場海水の光吸収度測定記録）

For measuring the light absorption coefficient of sea water at every depth, a turbidity-meter was lowered into the depth by means of cabtyre cord and steel wire. The turbidity-meter consists of a light source box, a photocell box and an indicator. A parallel light beam projected from the light source of a tungsten lamp heated to about 2800°K reaches to a celenium photocell after passing through the water of 70 cm distance. Electric current induced in the photocell is read on the indicator on the deck. No filter was used in this measurement. Calibration was made in the laboratory before going on the cruise.

Depth of measurement was assumed from the angle of wire which supported the turbidity-meter.

Measurement at sea was made by M. Fukuda.

Reading of gauge was normally made at every 10 metres, but in interesting sea areas values were recorded at more frequent depths.

Figures in the table represent the absorption coefficient per metre for the present instrument.

Table 20. Data on light absorption of water in 1955 cruise to the Bering Sea

Depth (m)	Os 1	Os 2	Os 3	Os 4	Os 5	Os 6	Os 7	Os 8	Os 9	Os 10	Os 11
5	0.32	0.32	0.07	0.35	0.30	0.27	0.57	0.43	0.38	0.28	0.28
10	0.32	0.32	0.09	0.33	0.29	0.27	0.63	0.41	0.37	0.30	0.27
20	0.48	0.33	0.11	0.33	0.30	0.27	0.63[1)]	0.40	0.37	0.35[2)]	0.32
30	0.37	0.32	0.11	0.33	0.28	0.27	0.53	0.39	0.36	0.29	[3)]
40	0.36	0.30	0.12	0.32	0.28	0.28	0.48	0.42	0.36	0.28	0.29
50	0.35	0.32	0.14	0.33	0.31	0.26	0.39	0.39	0.35	0.27	0.25
60	0.31	0.33	0.24	0.32	0.31	0.29	0.37	0.40	0.32	0.28	0.24
70	0.33		0.29	0.34	0.28	0.26	0.35	0.42	0.32	0.29	0.25
80	0.29		0.30	0.30	0.28	0.26	0.35	0.44	0.31	0.27	0.24
90	0.29		0.29		0.30	0.27	0.33	0.43	0.31	0.26	
100	0.27		0.28		0.31	0.27	0.34	0.40	0.33	0.26	
110			0.28		0.32	0.26	0.33	0.40		0.25	
120			0.27		0.31	0.28	0.31	0.40		0.25	
130			0.23		0.30	0.26	0.31	0.39		0.26	
140			0.14			0.25	0.32	0.36			
150							0.30				

1) 14m 1.96, 17m 1.94 2) 23m over 0.6 3) 23m over 0.4

Table 20. (Continued)

Depth (m)	Os 12	Os 13	Os 14	Os 15	Os 16	Os 17	Os 18	Os 19	Os 20	Os 21	Os 22
5	0.34	0.34	0.34	0.45		0.51	0.33	0.33	0.37	0.36	0.32
10	0.31	0.35	0.32	0.44		0.54	0.34	0.33	0.36	0.35	0.32
20	0.26	0.30	0.33	0.40	0.42	[5]	0.37 [7]	0.33	0.30	0.25	0.34
30	0.27	0.33	0.39 [4]	0.37	0.41	0.49 [6]	0.36	0.31	0.44	0.23	0.31
40	0.26	0.28	0.30	0.29	0.39	0.48	0.34	0.30	0.30 [8]	0.22	0.28
50	0.27	0.27	0.26	0.24	0.37	0.49	0.36	0.34	0.34	0.19	0.36
60	0.27	0.27	0.26	0.26	0.34	0.45		0.32	0.22	0.13	0.30
70	0.27	0.28	0.26	0.26	0.31	0.43		0.28	0.20	0.10	0.31
80	0.27	0.26	0.27	0.29						0.09	0.34
90	0.27	0.25	0.26							0.09	0.33
100	0.29	0.25	0.25							0.11	0.26
110	0.30	0.26	0.27							0.33	0.26
120		0.26	0.27							0.37	0.31
130		0.40	0.25							0.37	
140			0.29								

4) 32m over 0.5 5) 18m 0.58 6) 20m over 0.65, 22m 0.53
7) 18m 0.40, 19m over 0.5 8) 31m over 0.5, 33m 0.26

Table 20. (Continued)

Depth (m)	Os 23	Os 24	Os 25	Os 26	Os 27	Os 28	Os 29	Os 30	Os 31	Os 32	Os 33
5	0.26	0.42		0.45	0.60	0.32	0.30	0.34	0.35	0.55	0.27
10	0.33	0.43		0.40	0.54	0.32	0.30	0.34	0.39	0.58	0.27
20	0.60	0.47		0.57	0.22 [12]	0.31	0.34	0.32	0.40	0.57	0.26
30	0.70 [9]	0.80		0.39 [11]	0.08	0.26	0.44	0.48	0.38	0.64	0.24
40	0.65	0.68 [10]	0.40	0.34	0.08	0.26	0.44	0.56	0.45	0.68	0.22
50	0.28	0.65	0.42	0.39	0.09	0.27	0.42	0.60	0.41	0.76	0.29
60	0.16	0.65	0.36	0.34		0.35	0.41	0.65			0.32
70	0.19	0.56				0.35					0.31
80	0.18	0.52									
90	0.17	0.48									
100	0.17	0.42									
110	0.16	0.34									
120	0.17	0.24									
130	0.18	0.20									
140	0.17	0.22									
150	0.20										
160	0.23										

9) 27m over 0.95 10) 28m 0.68, 32m over 0.90 35m 0.78 11) 21m over 0.8, 25m 0.40
12) 17m 0.18, 21m 0.23

Table 20. (Continued)

Depth (m)	Os 34	Os 35	Os 36	Os 37
5	0.13	0.18	0.33	0.47
10	0.23	0.17	0.34	0.44
20	0.28	0.21	0.40	0.50
30	0.25	0.07	0.52[13)]	0.80
40	0.26	0.02	0.44	0.38[14)]
50	0.25	0.02	0.31	0.36
60	0.32	0.03	0.28	0.36
70	0.30	0.03	0.28	0.38
80	0.30	0.02	0.28	0.40
90	0.32	0.04	0.33	0.39
100	0.35	0.07	0.28	0.40
110	0.42	0.13	0.28	0.39
120		0.16	0.32	0.35
130		0.62	0.31	0.33
140		0.69	0.32	0.33
150		0.73		0.30

13) 15m 0.23, 25m 0.52, 28m over 0.8 14) 30m over 0.8

10. Data on Chlorophyll Content of Phytoplankton
(植物プランクトン葉緑素記録)

One of the double plankton collections sampled with 20 cm X 70 cm fine mesh net (0.086 mm in mesh size) by vertical haul from 50 metre depth was used for determination of chlorophyll content.

The sample was extracted immediately with 90 % acetone. The optical density at 665 mμ was determined on AKA phototube colorimeter. The content of chlorophyll-a was estimated from Richard & Thompson's equation (Richard and Tompson, 1952. Jour. Mar. Res. Vol. 2, 156-172).

Measurement was made by K. Kato aboard the ship.

The data presented here give observed values of chlorophyll-a without conversion for unit amount of water.

Table 21. Data on chlorophyll determination in 1955 cruise to the Bering Sea

Station	Chlorophyll-a (γ, in a haul)	Station	Chlorophyll-a (γ, in a haul)	Station	Chlorophyll-a (γ, in a haul)	Station	Chlorophyll-a (γ, in a haul)	Station	Chlorophyll-a (γ, in a haul)
Os 3	2.5 γ	Os 10	6.0 γ	Os 17	55.1 γ	Os 24	33.6 γ	Os 31	124.2 γ
4	3.0	11	57.7	18	49.5	25	68.3	32	7.7
5	3.6	12	38.3	19	7.4	26	98.4	33	4.7
6	2.6	13	30.8	20	410.4	27	444.8	34	47.4
7	84.8	14	25.9	21	48.4	28	6.7	35	4.0
8	23.9	15	31.5	22	18.2	29	148.1	36	7.1
9	13.0	16	65.5	23	146.5	30	53.6	37	81.4

11. Data on Displacement Volume and Weight of Plankton Samples Collected with Fine Mesh Net

（細目ネット採集によるプランクトン排水量及び重量記録）

A conical net, 20 cm X 70 cm, made of bolting silk XX 16, having ca 0.086 mm of mesh aperture, was hauled from about 50 metre depth to the surface. No flow-meter was attached on the net, so that the amount of water filtered by the net is unknown, but a current-meter was attached on the wire apart from the net for purpose of registering the actual distance of haul. When wind blew violently, the hauling distance may certainly have been increased. In calculating the amount of samples for definite volume of water correction of error due to increase of hauling distance was made, and then, an estimate (0.25) of filtration coefficient of such type of net (Motoda *et al.* 1957. Bull. Fac. Fish., Hokkaido Univ. Vol. 8, No. 1) was adopted; every datum is multiplied by 0.25.

At every hydrographic station duplicate hauls were carried out, and one of the two samples was used for the chlorophyll determination.

Measurement of wet displacement volume was made with aspiration filtering apparatus, and wet weight was measured on the samples retained on the filter disc of this apparatus.

Measurement of volume and weight of the samples was made by S. Motoda, T. Kawamura, M. Anraku and K. Karohji.

Table 22. Plankton volume data (20 cm × 70 cm,

Station	Position		Ship's date	Ship's time	Length of wire run out (m)	Depth of haul assumed from wire angle (m)	Distance of haul estimathed by current meter attached on the wire (m)	Supposed filtration coefficent of the net used
Os 1	51-43 N	160-30 E	June 26	20:00	50	50	50	0.25
〃 2	52-52 N	161-50 E	27	15:00	50	47	59	0.25
〃 3	53-00 N	164-00 E	28	11:25	50	50	54	0.25
〃 4	53-01 N	166-00 E	29	08:15	50	49	55	0.25
〃 5	53-00 N	168-00 E	29	18:07	50	50	61	0.25
〃 6	53-02 N	170-00 E	30	14:40	50	50	52	0.25
〃 7	53-02 N	172-00 E	July 1	14:50	50	43	61	0.25
〃 8	54-30 N	170-33 E	2	04:41	50	50	63	0.25
〃 9	55-58 N	169-11 E	3	06:20	50	46	62	0.25
〃 10	57-41 N	167-59 E	4	10:18	50	50	59	0.25
〃 11	58-29 N	166-32 E	4	19:23	50	48	53	0.25
〃 12	59-00 N	170-00 E	5	14:15	50	50	60	0.25
〃 13	58-30 N	173-15 E	6	13:37	50	49	60	0.25
〃 14	56-55 N	173-17 E	7	05:55	50	50	56	0.25
〃 15	55-10 N	173-17 E	7	19:50	50	48	50	0.25
〃 16	53-25 N	173-38 E	8	07:40	50	47	61	0.25
〃 17	53-10 N	175-04 E	8	17:32	50	49	57	0.25
〃 18	52-50 N	176-56 E	9	03:10	50	46	62	0.25
〃 19	52-28 N	178-40 E	9	12:22	50	44	50	0.25
〃 20	52-30 N	178-54 E	9	23:45	50	45	62	0.25
〃 21	53-14 N	178-40 E	10	17:08	50	50	50	0.25
〃 22	53-54 N	178-40 W	10′	00:30	50	49	50	0.25
〃 23	53-03 N	178-52 W	10′	12:32	50	49	50	0.25
〃 24	53-50 N	178-52 W	10′	19:50	50	50	50	0.25
〃 25	53-34 N	178-48 W	11	08:45	50	46	55	0.25
〃 26	57-00 N	178-58 W	11	19:26	50	49	50	0.25
〃 27	58-49 N	178-43 W	12	08:20	50	41	50	0.25
〃 27	〃	〃	〃	10:08	50	47	50	0.25
〃 28	57-16 N	171-50 W	14	10:35	50	48	64	0.25
〃 29	57-27 N	170-11 W	14	17:05	50	49	50	0.25
〃 30	57-26 N	167-05 W	15	05:30	50	49	50	0.25
〃 31	57-23 N	163-58 W	15	18:05	50	49	50	0.25
〃 32	57-16 N	161-40 W	16	05:07	50	50	50	0.25
〃 33	56-04 N	163-15 W	19	20:00	50	50	50	0.25
〃 34	54-46 N	165-19 W	20	10:00	50	48	54	0.25
〃 35	53-40 N	163-31 W	20	22:36	50	50	50	0.25
〃 36	52-58 N	162-19 W	21	16:40	50	48	50	0.25
〃 37	52-15 N	161-09 W	21	14:45	50	49	50	0.25

fine mesh XX 16 net) in 1955 cruise to the Bering Sea

Adjusted displacement volume per 1000 m^3 of water (cc)	Adjusted wet weight per 1000 m^3 of water (gr)	Remarks
328	37	Mixed with copepods
415	123	Mixed with copepods and chaetognaths
193	72	Mixed with copepods
118	16	
236	38	Mixed with copepods
219	38	Exclusively diatoms
37	154	Exclusively diatoms
188	82	Copepods abundant
150	64	Copepods abundant
79	66	Copepods abundant
176	134	Copepods abundant
236	114	Copepods and chaetognaths abundant
78	136	
194	53	Copepods abundant
328	195	Exclusively diatoms
197	153	Mixed with copepods
389	220	Copepods abundant
112	149	Mixed with copepods
141	175	
650	403	Exclusively diatoms
156	201	
203	162	Mixed with copepods
437	339	Exclusively diatoms
156	207	Mixed with copepods
250	206	Mixed with copepods
281	204	Mixed with copepods
375	159	Exclusively diatoms
78	82	
87	94	
125	159	Mixed with copepods and chaetognaths
75	19	Copepods abundant
356	221	Nearly exclusively copepods
94	34	
125	40	Copepods abundant
88	69	Exclusively diatoms
187	31	Copepods abundant
93	43	Mixed with copepods
500	145	Exclusively diatoms

12. Data on Displacement Volume and Weight of Plankton Samples Collected with 45 cm Standard Net

(45cm標準ネット採集によるプランクトン排水量及重量記録)

A conical net, 45 cm X 165 cm, made of bolting silk GG 54, having ca 0.33 mm of mesh aperture, was hauled from about 150 metre depth to the surface unless the depth of sea bottom was shallower than this. No flow-meter was attached on the net, so that the amount of water filtered by the net is unknown, but a current-meter was attached on the wire apart from the net for purpose of registering the actual distance of haul. In calculating the amount of samples for difinite volume of water correction of error due to increase of hauling distance in bad weather was made, and then, an estimate (0.76) of filtration coefficient of similar type of net (Motoda *et al*. 1957. Bull. Fac. Fish., Hokkaido Univ. Vol. 8, No. 1) was adopted; every datum is multiplied by 0.76.

At every hydrographic station duplicate hauls were carried out, and the mean of catches between two hauls is calculated.

Measurement of wet displacement volume was made with aspiration filtering apparatus, and wet weight was measured on the samples retained on the filter disc of this apparatus.

Measurement of volume and weight of the samples was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

Table 23. Plankton volume data (45 cm × 165 cm,

Station	Position	Ship's date	Ship's time	Length of wire (m)[1]	Depth of haul (m)[2]	Distance of haul (m)[3]	Filtration coefficient[4]	Displacement per 1000m³ (cc)[5]	Mean[6]	Weight per 1000m³ (cc)[7]
Os 1	51-43N 160-30E	June 26	1910	150	150	150	0.76	234	373	244
			2100	150	150	155	0.76	512		320
Os 2	52-52N 161-50E	27	1423	150	117	203	0.76	526	510	472
			1620	150	138	202	0.76	494		388
Os 3	53-00N 164-00E	28	1045	150	146	159	0.76	95	165	97
			1135	150	145	164	0.76	234		80
Os 4	53-01N 166-00E	29	0725	150	137	208	0.76	205	200	97
			0824	150	139	165	0.76	194		149
Os 5	53-00N 168-00E	29	1725	150	136	169	0.76	177	144	68
			1818	150	146	196	0.76	110		27
Os 6	53-02N 170-00E	30	1352	150	148	150	0.76	257	192	48
			1448	150	150	150	0.76	126		35
Os 7	53-02N 172-00E	July 1	1408	150	149	150	0.76	177	257	208
			1456	150	146	150	0.76	336		352
Os 8	54-30N 170-33E	2	0338	150	132	179	0.76	375	428	266
			0448	150	148	167	0.76	480		402
Os 9	55-58N 169-11E	3	0535	150	109	239	0.76	310	293	167
			0630	150	102	220	0.76	275		193
Os 10	57-41N 167-59E	4	0940	150	142	159	0.76	485	590	540
			1027	150	144	167	0.76	695		513
Os 11	58-29N 166-32E	4	1915	150	106	202	0.76	764	977	702
			2007	150	114	192	0.76	1190		688
Os 12	59-00N 170-00E	5	1405	150	138	159	0.76	558	433	435
			1510	150	137	152	0.76	308		268
Os 13	58-30N 173-15E	6	1330	150	136	175	0.76	498	551	396
			1440	150	142	167	0.76	604		421
Os 14	56-54N 173-17E	7	0550	150	142	161	0.76	302	462	204
			0640	150	132	186	0.76	621		329
Os 15	55-10N 173-17E	7	1948	150	131	175	0.76	580	521	396
			2030	150	114	175	0.76	462		225
Os 16	53-25N 173-38E	8	0935	150	114	189	0.76	746	701	759
			1027	150	114	184	0.76	655		517
Os 17	53-10N 175-04E	8	1725	150	127	193	0.76	1295	1012	1278
			1815	150	111	219	0.76	728		735
Os 18	52-50N 176-56E	9	0300	150	90	262	0.76	771	980	685
			0355	150	101	225	0.76	1189		1185
Os 19	52-28N 178-40E	9	1217	150	101	207	0.76	296	317	242
			1305	150	120	214	0.76	337		141
Os 20	52-30N 178-54W	9-10	2340	150	113	220	0.76	762	495	827
			0030	150	121	184	0.76	228		248

GG 54 net) in 1955 cruise to the Bering Sea

Mean[8)]	Remarks
282	5 jelly-fishes and 3 *Tomopteris* are removed before measurement. 2 jelly-fishes and 6 *Tomopteris* are removed before measurement.
430	Diatoms are abundantly contained. Diatoms are abundantly contained.
89	2 jelly-fishes are removed before measurement. A jelly-fish is removed before measurement.
123	20 jelly-fishes are removed before measurement. 10 jelly-fishes are removed before measurement.
48	6 jelly-fishes are removed before measurement. A jelly-fish is removed before measurement.
42	4 jelly-fishes are removed before measurement. 6 jelly-fishes are removed before measurement.
280	Diatoms are abundantly contained. 2 jelly-fishes are removed before measurement. Diatoms are abundantly contained.
334	A jelly-fish is removed before measurement. 4 jelly-fishes are removed before measurement.
280	2 jelly-fishes are removed before measurement. A jelly-fish is removed before measurement.
527	8 jelly-fishes are removed before measurement.
695	3 jelly-fishes are removed before measurement. 2 jelly-fishes are removed before measurement.
352	A jelly-fish is removed before measurement. A jelly-fish is removed before measurement.
409	6 jelly-fishes are removed before measurement. 5 jelly-fishes are removed before measurement.
267	2 jelly-fishes are removed before measurement.
311	2 jelly-fishes and 5 *Tomopteris* are removed before measurement. 5 jelly-fishes and 2 *Tomopteris* are removed before measurement.
638	A jelly-fish is removed before measurement. 2 fish larvae are removed before measurement.
1002	A *Tomopteris* is removed before measurement.
935	3 jelly-fishes and 5 *Tomopteris* are removed before measurement. 2 fish larvae are removed before measurement.
192	2 jelly-fishes and a *Tomopteris* are removed before measurement. A *Tomopteris* is removed before measurement.
538	3 jelly-fishes and a *Tomopteris* are removed before measurement. Diatoms are abundantly contained. A jelly-fish is removed before measurement. Diatoms are abundantly contained.

Table 23.

Station	Position	Ship's date	Ship's time	Length of wire (m)[1]	Depth of haul (m)[2]	Distance of haul (m)[3]	Filtration coefficient[4]	Displacement per 1000m³ (cc)[5]	Mean[6]	Weight per 1000m³ (cc)[7]
Os 21	53-14N 178-40E	July 10	1700	150	133	157	0.76	628	498	442
			1750	150	134	165	0.76	367		250
Os 22	53-54N 178-40E	10′	0025	150	133	170	0.76	702	555	528
			0100	150	132	169	0.76	407		247
Os 23	53-03N 178-52W	10′	1230	150	134	167	0.76	601	587	610
			1340	150	138	158	0.76	573		596
Os 24	53-54N 178-52W	10′	1940	150	114	150	0.76	490	567	406
			2030	150	147	154	0.76	643		441
Os 25	55-34N 178-48W	11	0835	150	118	207	0.76	405	527	352
			0935	150	114	220	0.76	648		618
Os 26	57-00N 178-58W	11	1920	150	134	173	0.76	388	532	333
			2015	150	139	164	0.76	675		460
Os 27	58-49N 178-43W	12	0810	150	93	329	0.76	435	366	420
			1000	150	94	229	0.76	300		307
Os 28	57-16N 171-50W	14	1003	100	77	154	0.76	232	279	96
			1038	100	86	137	0.76	325		297
Os 29	57-27N 170-11W	14	1655	50	48	68	0.76	984	966	528
			1700	50	47	57	0.76	948		613
Os 30	57-26N 167-05W	15	0520	50	49	50	0.76	1995	1245	1662
			0527	50	49	61	0.76	495		633
Os 31	57-23N 163-58W	15	1755	50	46	63	0.76	2140	2389	1280
			1758	50	49	57	0.76	2638		2370
Os 32	57-16N 161-40W	16	0500	50	50	52	0.76	547	693	115
			0500	50	50	56	0.76	838		259
Os 33	56-04N 163-15W	19	1952	50	50	50	0.76	608	787	317
			1956	50	49	57	0.76	966		420
Os 34	54-46N 165-19W	20	0945	150	146	162	0.76	300	284	249
			0955	150	133	175	0.76	268		202
Os 35	53-40N 163-31W	20	2225	150	148	150	0.76	214	314	325
			2310	150	146	150	0.76	414		103
Os 36	52-58N 162-19W	21	0630	150	142	157	0.76	236	241	101
			0740	150	146	150	0.76	246		117
Os 37	52-15N 161-09W	21	1435	150	142	160	0.76	284	269	256
			1550	150	149	150	0.76	336		281

1) Length of wire run out (m) 2) Depth of haul assumed from wire angle (m) 3) Distance of net used 5) Adjusted displacement volume per 1000m³ of water (cc) 6) Adjusted mean displacement 8) Adjusted mean wet weight per 1000m³ of water (gr)

(Continued)

Mean[8)]	Remarks
	3 jelly-fishes, a *Tomopteris* and squid larvae are removed before measurement.
346	
	3 jelly-fishes are removed before measurement.
	16 jelly-fishes are removed before measurement.
838	
	7 jelly-fishes and 3 *Tomopteris* are removed before measurement.
	2 jelly-fishes are removed before measurement. Diatoms are abundantly contained.
603	
	7 jelly-fishes are removed before measurement.
	Diatoms are abundantly contained.
424	
	Diatoms are abundantly contained.
485	
	A jelly-fish is removed before measurement.
	4 jelly-fishes are removed before measurement.
397	
	Diatoms are abundantly contained.
264	
	Diatoms are abundantly contained.
197	
	4 jelly-fishes are removed before measurement.
571	
1148	
	A jelly-fish is removed before measurement.
1825	
	3 jelly-fishes are removed before measurement.
	6 jelly-fishes are removed before measurement.
187	
	22 jelly-fishes are removed before measurement.
369	
	A jelly-fish is removed before measurement.
	4 jelly-fishes and a *Tomopteris* are removed before measurement.
226	
	A *Tomopteris* is removed before measurement.
	A jelly-fish is removed before measurement.
214	
	6 jelly-fishes are removed before measurement.
	2 jelly-fishes are removed before measurement.
109	
	12 jelly-fishes are removed before measurement. Diatoms are abundantly contained.
294	
	5 jelly-fishes are removed before measurement. Diatoms are abundantly contained.

haul estimated by current meter attached on the wire (m) 4 Supposed filtration coefficient of the volume per 1000m³ of water (cc) 7) Adjusted wet weight of samples per 1000m³ of water (gr)

13. Data on Displacement Volume and Weight of Plankton Samples Collected with Underway Catcher

（航走採集によるプランクトン排水量及重量記録）

The sampling was made with Handy Underway Plankton Catcher, Model II, (Motoda, 1954. Bull. Fac. Fish., Hokkaido Univ. Vol. 5, No. 2) by towing at 9 knots normally for 20 minutes.

As no flow-meter was provided on the instrument, the catches are not valued as quantitative collections. The data are presented merely for comparison of abundance of catches at the surface in various localities, without conversion to the amount of catches per unit amount of water. Water tunnel in the head piece of the instrument is 5 cm in diameter, so that, if all of the water column corresponding to the area of mouth opening has passed through the net behind, the amount of water filtered during 20 minute tow at 9 knots is calculated to be 10.9 m^3. Actual amount of water that has been filtered by the net must be much less. Diurnal variation of surface catches may be involved in the data.

Displacement volume was measured by means of aspiration filtering apparatus and the weight was measured on the samples retained on the filter of the apparatus.

Measurement was made by S. Motoda and K. Karohji.

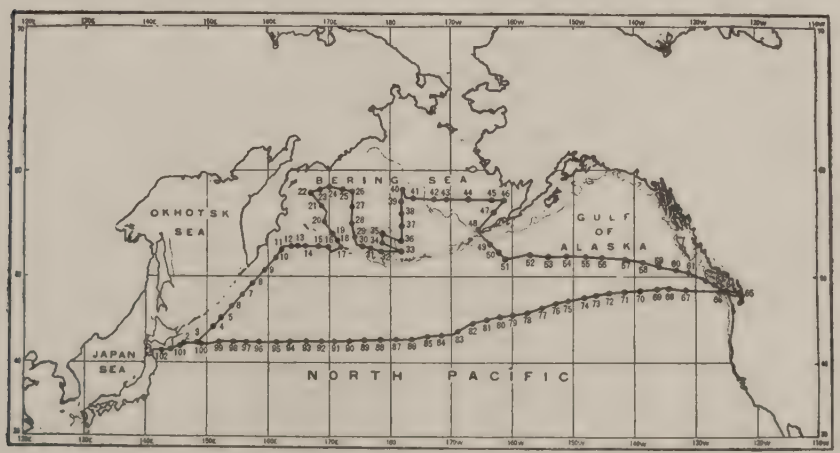

Fig. 18. Stations of underway plankton samplings in 1955 cruise of the "Oshoro Maru"

Table 24. Plankton volume data (underway sampling) in

No. of station	Corresponding No. of hydrographic station	Ship's date	Ship's time	Position	Displacement volume for 20 minute tow (cc)
1		June 22	08:01–08:21	42:04.5 N–143:48.5 E	1.8
2		〃 〃	19:56–20:16	42:27.7 N–146:07.0 E	2.0
3		〃 23	07:48–08:08	42:46.0 N–148:25 E	1.2
4		〃 〃	19:54–20:14	44:06 N–150:10 E	17.2
5		〃 24	07:53–08:13	45:22 N–151:50 E	4.0
6		〃 〃	19:55–20:15	46:43 N–153:34 E	2.6
7		〃 25	07:55–08:15	48:03 N–155:20 E	1.2
8		〃 〃	19:50–20:10	49:30 N–157:20 E	3.4
9		〃 26	10:00–10:20	50:50 N–159:10 E	0.4
10		〃 27	08:06–08:26	52:12 N–161:03.5 E	0.6
11		〃 〃	16:50–17:10	52:52 N–161:50 E	2.5
12		〃 28	07:50–08:10	53:00 N–163:25 E	2.5
13		〃 〃	13:42–14:02	53:00 N–164:10 E	0.2
14	Os 4	〃 29	09:40–10:00	53:00 N–166:00 E	0.3
15	Os 5	〃 30	05:25–05:45	53:02 N–168:00 E	0.4
16	Os 6	〃 〃	15:30–15:50	53:02 N–170:00 E	1.0
17	Os 7	July 1	15:48–16:08	53:02 N–172:00 E	2.4
18	Os 8	〃 〃	18:25–18:45	53:24 N–171:44 E	2.0
19		〃 2	09:39–09:59	54:30 N–170:33 E	0.4
20	Os 9	〃 3	08:13–08:33	55:51 N–169:16 E	2.0
21	Os 10	〃 4	11:30–11:50	57:35 N–168:11 E	1.0
22	Os 11	〃 〃	21:00–21:20	58:29 N–156:32 E	1.4
23		〃 5	07:20–07:40	58:47 N–168:34 E	0.9
24	Os 12	〃 〃	15:35–15:55	59:00 N–170:00 E	0.5
25		〃 6	08:42–09:02	58:40 N–172:15 E	0.2
26	Os 13	〃 〃	17:30–17:40	58:30 N–173:15 E	3.2
27		〃 7	07:20–07:40	56:54 N–173:17 E	1.4
28	Os 15	〃 〃	21:20–21:40	55:08 N–173:17 E	2.9
29	Os 16	〃 8	11:22–11:42	53:25 N–173:36 E	2.0
30	Os 17	〃 〃	18:02–18:22	53:10 N–175:04 E	2.5
31	Os 18	〃 9	04:55–05:15	52:50 N–176:56 E	1.5
32	Os 19	〃 〃	13:25–13:45	51:31 N–178:39 E	1.4
33	Os 20	〃 〃	02:10–02:30	52:32 N–178:52 W	2.5
34	Os 21	〃 10	19:30–19:50	53:11 N–178:48 E	6.5
35	Os 22	〃 10′	01:55–02:15	53:51 N–178:40 E	1.5
36	Os 23	〃 〃	14:05–14:25	53:03 N–178:52 W	2.6
37	Os 24	〃 〃		53:50 N–178:52 W	1.5
38	Os 25	〃 11	10:10–10:30	55:38 N–178:46 W	1.2
39	Os 26	〃 〃		57:00 N–178:52 W	2.2
40	Os 27	〃 12	11:25–11:45	58:49 N–178:43 W	6.0

1955 cruise to the Bering Sea and northern North Pacific

Wet weight for 20 minute tow (gr)	Remarks
2.6	Diatoms mixed with copepods
3.0	Copepods mixed with amphipods
1.3	Exclusively diatoms
18.2	Copepods and euphausiids abundant
4.1	Copepods
3.6	Copepods mixed with amphipods
1.4	Diatoms mixed with copepods
4.4	Diatoms mixed with copepods and chaetognaths
1.0	Copepods
1.2	Diatoms mixed with copepods
4.0	Exclusively diatoms
3.6	〃
0.3	Diatoms
0.2	Diatoms mixed with copepods
0.2	〃
0.7	Exclusively diatoms
2.6	〃
4.5	〃
0.3	Exclusively copepods
1.6	〃
2.0	〃
1.4	〃
0.8	〃
0.5	Diatoms mixed with copepods
0.3	
4.0	Exclusively copepods
1.2	〃
1.7	Diatoms mixed with copepods
2.5	〃
2.4	Copepods mixed with chaetognaths
1.9	〃
1.4	Copepods mixed with diatoms
2.9	Exclusively diatoms
7.2	Copepods abundant
2.9	Diatoms mixed with copepods
3.6	Exclusively diatoms
3.0	Diatoms mixed with copepods, chaetognaths and polychaetes
1.3	Copepods
2.9	Copepods mixed with amphipods, euphausiids and jellyfish
6.8	Exclusively diatoms

Table 24.

No. of station	Corresponding No. of hydrographic station	Ship's date	Ship's time	Position			Displacement volume for 20 minute tow (cc)
41		July 13	18:42–19:05	57:42	N–176:20	W	1.2
42		〃 14	08:03–08:23	57:27	N–172:41	W	0.6
43	Os 29	〃 〃	17:37–17:57	57:27	N–170:11	W	0.4
44	Os 30	〃 15	06:05–06:25	57:26	N–167:05	W	0.4
45	Os 31	〃 〃	18:30–18:50	57:20.3	N–163:58	W	3.6
46	Os 32	〃 16	03:10–03:30	57:16	N–161:40	W	0.6
47	Os 33	〃 19	20:42–21:02	56:04	N–163:15	W	2.1
48	Os 34	〃 20	10:35–10:55	54:46	N–165:19	W	1.6
49	Os 35	〃 21	00:05–00:25	53:40	N–163:31	W	1.2
50	Os 36	〃 〃	08:15–08:35	52:58	N–162:19	W	1.8
51	Os 37	〃 〃	16:20–16:40	52:15	N–161:09	W	2.5
52		〃 22	07:40–08:00	52:25	N–157:03	W	0.6
53		〃 〃	20:00–20:20	52:19	N–154:12	W	1.3
54		〃 23	07:45–08:05	53:13	N–151:06	W	0.3
55		〃 〃	19:56–20:16	52:06	N–147:56	W	1.2
56		〃 24	07:50–08:10	52:01	N–145:02	W	1.2
57		〃 〃	19:45–20:05	51:50	N–141:45	W	0.8
58		〃 25	08:00–08:20	51:24	N–138:47	W	0.6
59		〃 〃	20:00–20:20	50:58	N–136:06	W	0.6
60		〃 26	07:55–08:15	50:35	N–133:22	W	0.3
61		〃 〃	19:50–20:10	50:15	N–131:06	W	1.0
62		〃 27	07:52–08:12	49:55	N–128:47	W	0.2
63		〃 28	08:00–08:20	49:31	N–127:38	W	2.4
63		〃 〃	19:40–20:00	48:36	N–125:22	W	1.4
65		〃 29	08:25–08:45	48:09	N–123:21	W	0.8
66		August 9	08:03–08:23	48:37	N–126:25	W	0.2
67		〃 10	07:40–08:00	48:48	N–131:50	W	0.2
68		〃 〃	19:47–20:07	48:57	N–134:34	W	1.2
69		〃 11	08:00–08:20	48:53.5	N–136:57	W	0.8
70		〃 〃	20:00–20:20	48:38	N–139:28	W	1.0
71		〃 12	07:55–08:15	48:31	N–141:47	W	1.0
72		〃 〃	19:55–20:15	48:09	N–144:07	W	2.6
73		〃 13	08:02–08:22	47:56	N–146:05	W	2.6
74		〃 〃	20:00–20:20	47:40	N–148:24	W	2.3
75		〃 14	07:50–08:10	47:23	N–150:41	W	1.4
76		〃 〃	19:45–20:05	46:39	N–152:33	W	0.8
77		〃 15	08:00–08:20	46:23	N–155:02	W	1.0
78		〃 〃	20:00–20:20	45:48	N–157:28	W	2.0
79		〃 16	07:54–08:14	45:31	N–159:59.5	W	0.7
80		〃 〃	19:55–20:15	45:12	N–161:51	W	1.0

(Continued)

Wet weight for 20 minute tow (gr)	Remarks
1.6	Exclusively copepods
0.8	〃
0.8	Copepods
0.6	〃
3.5	Exclusively copepods
1.0	Copepods and hydromedusae
2.2	Exclusively zoea larva
2.0	Diatoms mixed with copepods
1.5	
2.5	Copepods
2.0	Exclusively diatoms
1.9	Diatoms mixed with copepods
1.5	Diatoms mixed with euphausiids
1.2	Exclusively copepods
1.5	Amphipods and copepods
1.6	〃
1.2	
1.6	Copepods mixed with amphipods
0.8	Diatoms mixed with copepods
0.7	Copepods
1.2	
0.3	Diatoms mixed with copepods
2.5	Jellyfish
1.2	Exclusively diatoms
0.5	〃
0.1	
0.1	
2.9	Amphipods and copepods
1.4	Diatoms mixed with copepods
1.6	Amphipods and copepods
0.7	Diatoms mixed with copepods
2.3	Chaetognaths
3.6	Exclusively copepods
3.1	〃
1.3	〃
1.6	Diatoms mixed with amphipods
1.2	〃
1.2	Euphausiids and chaetognaths
1.0	Copepods
1.0	〃

Table 24.

No. of station	Corresponding No. of hydrographic station	Ship's date	Ship's time		Position		Displacement volume for 20 minute tow (cc)
81		August 17	08:00–08:20	44:55	N–164:10	W	1.0
82		〃 〃	20:00–20:20	44:13	N–166:36	W	0.5
83		〃 18	08:00–08:20	43:31	N–169:03	W	0.2
84		〃 〃	20:00–20:20	43:11	N–171:33	W	>0.1
85		〃 19	07:50–08:10	43:11	N–174:12	W	>0.1
86		〃 〃	19:45–20:05	43:06	N–176:33	W	1.3
87		〃 20	07:50–08:10	43:06	N–179:20	W	0.2
88		〃 〃	19:45–20:05	43:08	N–178:21	E	1.2
89		〃 22	07:40–08:00	43:08	N–175:36	E	0.2
90		〃 〃	19:50–20:10	43:05	N–173:14	E	0.8
91		〃 23	08:00–08:20	43:05	N–170:48	E	>0.1
92		〃 〃	20:00–20:20	42:51	N–168:51.5	E	>0.1
93		〃 24	07:50–08:10	42:51	N–166:27	E	0.4
94		〃 〃	19:50–20:10	42:57	N–163:57	E	0.5
95		〃 25	07:58–08:18	42:51	N–161:16	E	0.3
96		〃 〃	19:55–20:15	42:48	N–159:18	E	>0.1
97		〃 26	07:45–08:05	42:48	N–156:50	E	>0.1
98		〃 〃	19:50–20:10	42:48	N–154:36	E	1.7
99		〃 27	08:00–08:20	42:48	N–151:56	E	>0.1
100		〃 〃	19:45–20:05	42:45	N–149:35	E	0.8
101		〃 28	12:25–12:45	42:24	N–146:00	E	>0.1
102		〃 〃	05:50–06:10	41:49	N–142:32.5	E	>0.1

(Continued)

Wet weight for 20 minute tow (gr)	Remarks
1.0	Copepods
0.5	Copepods and euphausiids
0.3	Copepods mixed with chaetognaths
>0.1	Copepods
>0.1	
1.6	Euphausiids and *Doliolum*
0.1	
2.1	*Doliolum*
0.2	Diatoms mixed with copepods
0.2	*Doliolum*
>0.1	
>0.1	
0.2	Copepods
0.6	Copepods and *Doliolum*
0.2	Diatoms
>0.1	Diatoms
>0.1	
3.1	*Doliolum*
0.8	Copepods and chaetognaths
>0.1	Diatoms
>0.1	〃

14. Data on Displacement Volume and Weight of Plankton Samples Collected with Fish Larva Net

(稚魚ネット採集によるプランクトン排水量及重量記録)

Fish larva net, 130 cm in mouth diameter and 450 cm in length, was towed at the surface layer at a speed as low as about 2 knots for ten minutes keeping the net exposed to the extent of half of mouth ring above the sea surface. However, because of difficulty in operation this position of the mouth ring was not always kept, and accordingly, there was much inconstancy in amount of water entering the mouth of the net. The net was not provided with flow-meter. The data presented here give only roughly relative abundance of the catches in a tow in various localities (involving difference in catches due to sampling times of day).

Unusual large organisms such as jellyfish were removed from the samples before they were submitted to the measurement of volume and weight.

Fish larvae contained in the samples were also removed before the measurement. The number of fish larvae sampled is given in "15".

Displacement volume of samples was measured with aspiration filtering apparatus. The values represent approximately wet displacement volume.

The weighing of samples was made on the samples retained on the filter of the aspiration filtering apparatus. The values represent wet weight.

Measurement was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

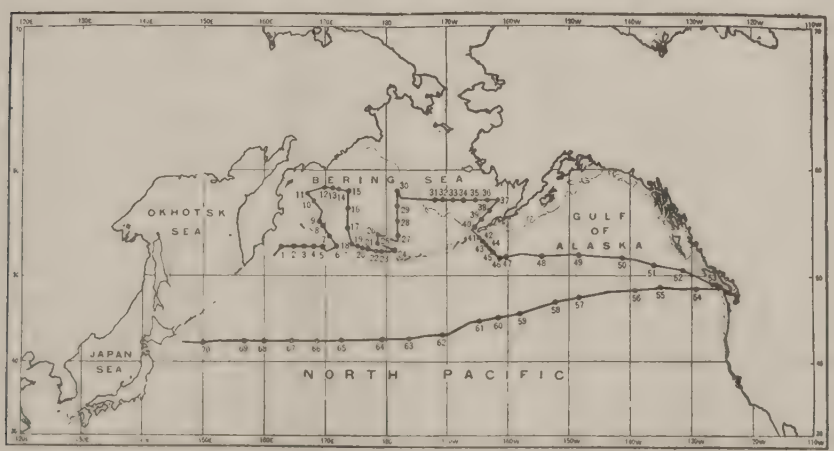

Fig. 19. Stations of fish-larva net tow in 1955 cruise of the "Oshoro Maru"

Table 25. Plankton volume data (fish-larva net) in 1955

No. of station	Corresponding No. of hydrographic station	Position		Ship's date (1955)	Ship's time	Displacement volume of total samples in a tow (cc)	Wet weight of total samples in a tow (gr)
1	Os 2	52-52 N	161-50 E	June 27	1640	50	42
2	Os 3	53-00 N	164-00 E	28	1305	1	1
3	Os 4	53-01 N	166-00 E	29	0930	5	1
4	Os 5	53-00 N	168-00 E	〃	2000	13	8
5	Os 6	53-02 N	170-00 E	30	1500	8	3
6	Os 7	53-02 N	172-00 E	July 1	1600	37	32
7	Os 8	54-30 N	170-33 E	〃	0090	2	>1
8		55-51 N	169-10 E	2	2000	25	10
9	Os 9	55-58 N	169-11 E	3	0830	8	5
10	Os 10	57-41 N	167-59 E	4	1115	3	1
11	Os 11	58-29 N	166-32 E	〃	2100	74	62
12	Os 12	59-00 N	170-00 E	5	1530	7	3
13		58-49 N	171-12 E	〃	2000	3	3
14		58-40 N	172-15 E	6	1730	12	21
15		58-02 N	173-16 E	〃	2110	72	84
16	Os 14	56-54 N	173-17 E	7	0720	1	2
17	Os 15	55-11 N	173-17 E	〃	2110	46	48
18	Os 16	53-25 N	173-38 E	8	1110	47	38
19	Os 17	53-10 N	175-04 E	〃	1910	75	79
20		53-14 N	175-36 E	〃	2030	182	186
21	Os 18	52-50 N	176-56 E	9	0440	77	81
22	Os 19	52-28 N	178-40 E	〃	1315	39	17
23		52-30 N	179-51 E	〃	1940	35	31
24	Os 20	52-30 N	178-54 W	10	0200	81	72
25	Os 21	53-14 N	178-40 E	〃	1930	88	80
26		53-29.5 N	178-40 E	〃	2130	187	183
27	Os 22	53-54 N	178-40 E	10′	0150	50	48
28	Os 23	53-03 N	178-52 W	〃	1400	15	16
29	Os 24	53-50 N	178-52 W	〃	2110	290	238
30	Os 25	55-34 N	178-48 W	11	1010	20	19
31	Os 26	57-00 N	178-58 W	〃	2050	59	50
32	Os 27	58-19 N	178-43 W	12	1120	52	40
33	Os 28	57-16 N	171-50 W	14	1050	2	1
34	Os 29	57-27 N	170-11 W	〃	1730	8	3
35		57-27 N	169-18 W	〃	2100	21	16
36	Os 30	57-26 N	167-05 W	15	0600	26	15
37	Os 31	57-23 N	163-58 W	〃	1820	missing	missing
38		57-19 N	163-21 W	〃	2030	255	246
39		57-12 N	161-45 W	19	0930	12	3
40	Os 33	56-04 N	163-15 W	〃	2030	11	12

cruise to the Bering Sea and northern North Pacific

Remarks

Phytoplankton abundant.
Phytoplankton considerably abundant.
Many winged insects.
Many ***Calanus***.
Many diatoms.
Many diatoms.
Many small-sized copepods.
Many ***Calanus***.
Small-sized copepods are included.

Parathemisto very abundant.

Many ***Calanus***.
Squid larvae abundant.
Squid larvae are included.
Squid larvae abundant.
Small-sized copepods are included.
Small-sized copepods are included.
Many squid larvae.
Many small-sized copepods.
Mainly diatoms.
Many copepods and ***Parathemisto***.
Exclusively diatoms.
Many ***Calanus***.
Parathemisto abundant.
Parathemisto adundant.
Exclusively diatoms.
Parathemisto and ***Tomopteris*** are included.

Many ***Calanus*** and ***Parathemisto***.
Mainly diatoms.

Many ***Parathemisto***.
Mainly diatoms.

Many ***Calanus*** and zoea; ***Limacina helicina*** also abundant.
Zoea are included
Jellyfish are removed before measurement.

Table 25.

No. of station	Corresponding No. of hydrographic station	Position				Ship's date (1955)		Ship's time	Displacement volume of total samples in a tow (cc)	Wet weight of total samples in a tow (gr)
41	Os 34	55-46	N	163-13	W	July	19	2130	52	42
42		54-46	N	165-19	W		20	1030	5	5
43	Os 35	53-43	N	163-36	W		〃	1030	17	16
44	Os 36	53-40	N	163-31	W		〃	2400	26	32
45	Os 37	52-58	N	162-19	W		21	0805	8	4
46		52-15	N	161-09	W		〃	1630	12	78
47		52-17	N	160-04	W		〃	2030	38	38
48		52-19	N	154-12	W		22	2000	20	8
49		52-03	N	148-06	W		23	1930	50	48
50		51-49	N	141-41	W		24	2015	26	22
51		50-59	N	136-08	W		25	1940	23	23
52		50-16	N	131-02	W		26	2010	143	135
53		48-37	N	125-23	W		28	2010	175	160
54		48-40	N	129-00	W	Aug.	9	2020	54	47
55		48-56	N	134-29	W		10	1930	30	19
56		48-38	N	139-28	W		11	1951	33	44
57		47-40	N	148-20	W		13	1930	126	116
58		46-39	N	152-33	W		14	1930	106	102
59		45-49	N	157-18	W		15	1910	46	40
60		45-13	N	161-42.5	W		16	1900	8	47
61		44-18	N	164-16	W		17	1915	17	31
62		43-11	N	171-16	W		18	1835	5	8
63		43-06	N	176-33	W		19	1848	8	18
64		43-08	N	178-26	E		21	1905	526	289
65		43-05	N	173-29.5	E		22	1900	68	106
66		42-57	N	169-04.5	E		23	1841	23	21
67		42-57	N	164-06	E		24	1905	28	24
68		42-48	N	159-40	E		25	1810	11	8
69		42-47.6	N	154-53	E		26	1830	273	456
70		42-45	N	149-52	E		27	1850	58	56

(Continued)

Remarks
Many ***Calanus***, ***Clione limacina*** present.
Many small-sized copepods.
Many small-sized copepods.
Many ***Sagitta*** and copepods.
Small number of zoea present; ***Limacina helicina*** and *Clio pyramidata* in considerable number.
Small number of zoea present.
Many ***Parathemisto***.
Parathemisto, ***Sagitta***, etc. present.
Many ***Parathemisto*** present; jellyfish are removed before mesurement.
Glaucothe present.
Glaucothe present.
Many ***Parathemisto*** and ***Sagitta***.
Ctenophores, ***Parathemisto*** and ***Sagitta*** present.
Many *Carinaria* are removed before measurement; many ***Parathemisto*** and ***Sagitta***.
Many ***Carinaria*** and 6 ***Vellela lata*** are removed; many copepods.
A ***Porpita***, 18 ***Vellela***, many ***Carinaria*** and a ***Cavolinia tridentata*** are removed.
Many copepods and ***Sagitta***.
Many hydromedusae.
Doliolum very abundant.
Doliolum abundant.
Themisto and mysis larvae present.
Doliolum very abundant.
Doliolum very abundant.
Doliolum very abundant.
Doliolum very abundant.
Doliolum very abundant.
Doliolum very abundant.
Sagitta very abundant.

15. Data on Fish Larvae Collected with Fish Larva Net
(稚魚ネット採集による稚魚記録)

Fish larva net, 130 cm in mouth diameter and 450 cm in length, was towed at the surface layer at a speed as low as about 2 knots for ten minutes keeping the net exposed to the extent of half of mouth ring above the sea surface.

Identification of fish larvae was made by S. Sato and K. Kobayashi.

Table 26. Data on collection of fish larvae in 1955 cruise to the Bering Sea and northern North Pacific

No. of station	Corresponding No. of hydrographic station	Position	Ship's date (1955)	Ship's time	Fish-larvae collected (Species or group)	Number of individuals
1	Os 2	52°-52′ N 161°-50′ E	June 27	1640	No fish-larva	
2	Os 3	53°-00′ N 164°-00′ E	28	1305	*Pleurogrammus monopterygius* (PALLAS)	1
3	Os 4	53°-01′ N 166°-00′ E	29	0930	No fish-larva	
4	Os 5	53°-00′ N 168°-00′ E	〃	2000	No fish-larva	
5	Os 6	53′-02′ N 170°-00′ E	30	1500	*Pleurogrammus monopterygius* (PALLAS)	3
9	Os 7	53°-02′ N 172°-00′ E	July 1	1600	*Pleurogrammus monopterygius* (PALLAS)	1
7	Os 8	54°-30′ N 170°-33′ E	2	0902	No fish-larva	
8		55°-51′ N 169°-10′ E	2	2000	*Pleurogrammus monopterygius* (PALLAS)	2
9	Os 9	55°-58′ N 169°-11′ E	3	0830	No fish-larva	
10	Os 10	57°-11′ N 167°-59′ E	4	1115	No fish-larva	
11	Os 11	58°-29′ N 166°-32′ E	〃	2100	*Hemilepidotus*	2
12	Os 12	59°-00′ N 170°-00′ E	5	1530	No fish-larva	
13		58°-19′ N 171°-12′ W	〃	2000	No fish-larva	
14		58°-40′ N 172°-15′ E	6	1730	No fish-larva	
15		59°-02′ N 173°-16′ E	〃	2110	*Hemilepidotus*	5
16	Os 14	56°-54′ N 173°-17′ E	7	0720	No fish-larva	
17	Os 15	55°-11′ N 173°-17′ E	〃	2110	*Lumpenus*	9
					Hemilepidotus	38
					Unidentified (a)	8
18	Os 16	53°-25′ N 173°-38′ E	8	1110	*Hemilepidotus*	3
19	Os 17	53°-10′ N 175°-04′ E	〃	1910	No fish-larva	
20		53°-14′ N 175°-36′ E	〃	2030	*Hemilepidotus*	53
					Ammodytes hexapterus (PALLAS)	4
					Lumpenus	18
					Pholidae	112
					Anoplopoma fimbria (PALLAS)	1
					Unidentified (a)	1
					Unidentified (b)	1
21	Os 18	52°-50′ N 176°-56′ E	9	0440	*Pleurogrammus monopterygius* (PALLAS)	1
22	Os 19	52°-28′ N 178°-40′ E	〃	1315	*Hexagrammos decagrammus* (PALLAS)	1

Table 26. (Continued)

No. of station	Corresponding No. of hydrographic station	Position	Ship's date (1955)	Ship's time	Fish-larvae collected (Species or group)	Number of individuals
23		52°-30′N 197°-51′E	July 9	1940	*Hexagrammos decagrammus* (PALLAS)	2
24	Os 20	52°-30′N 178°-54′W	10	0200	*Hexagrammos stelleri* TILESIUS	3
					Hexagrammos decagrammus (PALLAS)	5
					Lumpenus	7
					Pholidae	1
					Ammodytes hexapterus (PALLAS)	10
					Hemilepidotus	9
					Pleuronectinae	8
					Liparis	6
					Anoplopoma fimbria (PALLAS)	3
					Unidentied (b)	1
25	Os 21	53°-14′N 178°-40′E	〃	1930	*Pleurogrammus monopterygius* (PALLAS)	3
					Pleuronectinae	2
26		53°-29′N 178°-40′E	〃	2130	*Hemilepidotus*	21
					Lumpenus	18
					Pholidae	2
					Ammodytes hexapterus (PALLAS)	2
					Pleurogrammus monopterygius (PALLAS)	2
27	Os 22	53°-54′N 178°-40′E	10′	0150	*Pleurogrammus monopterygius* (PALLAS)	2
					Hemilepidotus	30
					Lumpenus	1
					Pholidae	42
					Anoplopoma fimbria (PALLAS)	1
					Unidentied (b)	1
28	Os 23	53°-03′N 178°-52′W	〃	1400	*Hexagrammos decagrammus* (PALLAS)	1
					Pholidae	3
29	Os 24	53°-50′N 178°-52′W	〃	2110	*Hexagrammos decagrammus* (PALLAS)	1
					Hemilepdotus	6
					Pholidae	11
					Anoplopoma fimbria (PALLAS)	2
30	Os 25	55°-34′N 178°-48′W	11	1010	*Pleurogrammus monopterygius* (PALLAS)	1
					Pholidae	4
31	Os 26	57°-00′N 178°-58′W	〃	2050	*Hemilepidotus*	1
32	Os 27	58°-49′N 178°-43′W	12	1120	No fish-larva	
33	Os 28	57°-16′N 171°-50′W	14	1050	No fish-larva	
34	Os 29	57°-27′N 170°-11′W	〃	1730	No fish-larva	
35		57°-27′N 169°-18′W	〃	2100	No fish-larva	
36	Os 30	57°-26′N 167°-05′W	15	0600	No fish-larva	
37	Os 31	57°-23′N 163°-58′W	〃	1820	No fish-larva	
38		57°-19′N 163°-21′W	〃	2030	*Hexagrammos stelleri* TILESIUS	1
					Hemilepidotus	1

Table 26. (Continued)

No. of station	Corresponding No. of hydrographic station	Position	Ship's date (1955)	Ship's time	Fish-larvae collected (Species or group)	Number of individuals
					Cottinae (a)	6
39		57°-12′N 161°-45′W	19	0930	No fish-larva	
40	Os 33	56°-04′N 163°-15′W	〃	2030	*Hexagrammos stelleri* TILESIUS	3
					Cottinae (b)	1
41		55°-46′N 163°-13′W	〃	2130	*Hexagrammos stelleri* TILESIUS	3
					Liparis	1
					Hemilepidotus	2
					Cottinae (b)	14
					Ammodytes hexapterus PALLAS	61
					Pleuronectinae	2
					Zoarcicae	2
42	Os 34	54°-46′N 165°-19′W	20	1030	*Ammodytes hexapterus* PALLAS	2
					Alectridium aurantiacum	1
43		53°-43′N 163°-36′W	20	2140	*Theragra chalcogramma* (PALLAS)	2
					Anoplopoma fimbria (PALLAS)	3
					Pholidae	408
44	Os 35	53°-40′N 163°-31′W	〃	2400	*Hexagrammos stelleri* TILESIUS	3
					Pholidae	345
45	Os 36	52°-58′N 162°-19′W	21	0805	Pholidae	4
46	Os 37	52°-15′N 161°-09′W	〃	1630	*Hexagrammos decagrammus* (PALLAS)	22
47		52°-17′N 160°-04′W	〃	2030	Pholidae	1194
					Hexagrammos decagrammus (PALLAS)	1
					Ammodytes hexapterus PALLAS	1
					Hemilepidotus	2
48		52°-19′N 154°-12′W	22	2000	*Hemilepidotus*	1
					Pholidae	425
49		52°-03′N 148°-06′W	23	1930	*Hexagrammos decagrammus* (PALLAS)	2
					Hemilepidotus	4
50		51°-49′N 141°-41′W	24	2015	No fish-larva	
51		50°-59′N 136°-08′W	25	1940	*Sebastes*	30
52		50°-16′N 131°-02′W	26	2010	*Sebastes*	2
					Tarletonbeania	11
53		48°-37′N 125°-23′W	28	2010	*Tarletonbeania*	1
					Liparis	5
					Sebastiscus	4
54		48°-40′N 129°-00′W	Aug. 9	2020	*Cololabis saira* (BREVOORT)	1
					Myctophidae	21
55		48°-56′N 134°-29′W	10	1930	Myctophidae	3
56		48°-38′N 139°-28′W	11	1951	No fish-larva	
57		47°-40′N 148°-20′W	13	1930	Myctophidae	7

Table 26. (Continued)

No. of station	Corresponding No. of hydrographic station	Position	Ship's date (1955)	Ship's time	Fish-larvae collected (Species or group)	Number of individuals
58		46°-39′ N 152°-33′ W	14	1930	No fish-larva	
59		45°-49′ N 157°-18′ W	15	1910	*Tarletonbeania*	1
60		45°-13′ N 161°-42′ W	16	1900	No fish-larva	
61		44°-18′ N 164°-16′ W	17	1915	*Cololabis saira* (BREVOORT)	6
62		43°-11′ N 171°-16′ W	18	1835	No fish-larva	
63		43°-06′ N 176°-33′ W	19	1848	*Cololabis saira* (BREVOORT)	1
					Scombrina	68
					Exocoetidae	3
64		43°-08′ N 178°-26′ E	21	1905	*Scombrina*	5
					Exocoetidae	3
65		43°-05′ N 173°-29′ E	22	1900	Exocoetidae	1
					Zeida (?)	1
66		42°-57′ N 169°-04′ E	23	1841	No fish-larva	
67		42°-57′ N 164°-06′ E	24	1905	*Cololabis saira* (BREVOORT)	5
					Unidentified (e)	1
68		42°-48′ N 159°-40′ E	25	1810	*Cololabis saira* (BREVOORT)	22
69		42°-47′ N 154°-53′ E	26	1830	No fish-larva	
70		42°-45′ N 149°-52′ E	27	1850	No fish-larva	

16. Data on Salmon Gill-Net Fishing
(鮭鱒流網試験記録)

Forty-four Tan of drift gill-net were used (1 Tan = 492 metres). The depth of the net was about 5.3-5.4 metres. The net used is made of Amilan having 4.2 Sun (12.7 cm) of mesh length when stretched. (目合4.2寸, 44反使用)

During the set in the sea the net was disconnected from the ship, but watched on the ship by means of Radar which caught the reflection from the corner reflector placed on the buoy on the net. (Ishida & Suzuki, 1954. Bull. Fac. Fish., Hokkaido Univ. Vol. 5, No. 1).

Operation was supervised by captain and deck officers, and all hands of crew and cadets were engaged in the work.

The fish caught were:

Oncorhynchus nerka (Walbaum), Sockeye salmen, Red Salmon, Blue-back salmon, Sukkegh salmon, ベニマス, ベニザケ

Oncorhynchus keta (Walbaum), Chum Salmon, Dog salmon, Calico salmon, Keta salmon, サケ, シロザケ

Oncorhynchus gorbuscha (Walbaum), Pink salmon, Humpback salmon, カラフトマス, セッパリマス

Oncorhynchus tschawytscha (Walbaum), King salmon, Spring salmon, Chinock salmon, Typee salmon, Tchavicke, マスノスケ

Salvelinus malma (Walbaum), Dolly vardon trout, オショロコマ

Pleurogrammus monopterygius (Pallas), Atka mackerel, キタノホッケ

None of *Oncorhynchus kisutch* (Walbaum) (Silver salmon, Coho salmon, Medium red salmon, Kisutch, ギンマス, ギンザケ) was caught.

Table 27. Data on salmon gill-net set in 1955 cruise to the Bering Sea

No. of fishing	Date and Time				Position of net set		Amount of gillnet used (Tan)	Direction of drift "toward"	Weather	Wind	
	Net set		Net haul								
	Date	Time	Date	Time	Lat. N	Long. E				Direction	Force
1	6-26	1851	6-27	0421	51-43.0	160-31.0	44	SW	f	NNE	1
2	6-27	1951	6-28	0446	52-56.0	162-28.0	44	E～SE	c	SW	4
3	6-28	1921	6-29	0441	53-00.0	165-14.0	44	NNE	b	E	1
4	6-29	1954	6-30	0510	53-02.0	168-00.0	44	W	c	WSW	3
5	6-30	1921	7- 1	0517	52-39.0	170-00.0	44	ENE	f	N	1
6	7- 2	1925	7- 3	0507	55-51.0	169-10.0	44	ENE	o	SW	3
7	7- 5	2042	7- 6	0434	58-49.0	171-12.0	44	SW	f	NE	2

No. of fishing	Surface temp. (°C)	Colour of sea	Transparency (m)	Number of individual fish caught						Catch per Tan
				Sockeye salmon (ベニ)	Chum salmon (シロ)	Pink salmon (マス)	King salmon (マスノスケ)	Dollyvardon trout (オショロコマ)	Total	
1	5.7	5	15.0	11	65	14	0	4	94	2.1
2	5.2	2	17.2	27	79	85	0	1	192	4.4
3	6.0	3	23.3	98	101	43	1	0	243	5.3
4	5.3	3	16.2	41	96	37	1	0	175	4.0
5	5.3	4	14.2	18	71	40	0	0	129	2.9
6	5.1	4	15.6	41	27	70	0	0	138	3.1
7	4.5	6	10.0	8	83	152*	2	22	267	6.0

* The number given in "Motoda and Fujii, 1956. Bull. Fac. Fish., Hokkaido Univ. Vol. 6, No. 4, Table 2" is mistaken.

17. Data on Measurement of Biological Characters of Salmon
(鮭鱒生物学的測定記録)

Measurement was made by T. Kubo and K. Kobayashi.
Scale reading for age determination was made by T. kubo.

Abbreviations:

Sex, F.	Female
M.	Male
F. L.	Fork length
H. L.	Head length
B. H.	Body height
B. W.	Body weight
G. W.	Gonad weight
Age, F_n.	Number of annuli on scale formed in fresh-water life
S_n.	Number of annuli on scale formed in salt water life
S. P.	Scale pattern

A. Non-occurrence of concentration as forming nuclear area
B. Occurrence of concentration of 7th-10th circuli
C. Occurrence of concentration of 1st-10th circuli
D. Occurrence of concentration of 1st-3rd circuli
CD. Intermediate pattern between C and D

Age is represented by Okada's (1939) formula which may be represented by Gilbert & Rich's (1927) formula as follows:

Represantation of age by Shun Okada (1939)	Represantation of age by Gilbert & Rich (1927)
F_1S_2	4_2
F_1S_3	5_2
F_1S_4	6_2
F_2S_2	5_3
F_2S_3	6_3
F_2S_4	7_3

Gilbert, C. H & Rich, W. H. (1927). Investigations concerning the red salmon runs of the Karluk River, Alaska. Bull. U. S. Bur. Fish. Vol. 43, Doc. No. 1021, 69 pp.
Okada, Shun (1939). Scale study on sockeye salmon. Hokkaido Fish Hatchery. (Unpublished)

Table 28. Data on measurement of salmon in 1955 cruise to the Bering Sea

1. Sockeye salmon, ベニザケ

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age
1	F	538	130	103	2.200	85	F_1–S_3
		595	116	141			F_2–S_3
2	F	580	110	130	2.600	30	F_2–S_3
	F	570	110	140	2.600	85	F_2–S_3
	F	570	100	140	2.900	115	F_2–S_3
	F	540	95	130	2.500	145	F_1–S_3
	F	540	95	125	2.200	125	F_1–S_3
	F	520	100	130	1.700	30	F_2–S_2
	M	630	150	150	3.400	30	F_2–S_3
	M	630	130	165	4.400	50	
	M	615	120	150	3.300	20	F_2–S_3
	M	610	120	150	3.400	55	F_2–S_3
	M	585	120	150	3.100	20	F_1–S_4
	M	570	100	150	2.900	60	F_1–S_3
	M	565	120	140	2.500	20	F_1–S_2
	M	520	110	120	2.000	35	F_3–S_2
	M	630	130	150	3.400		F_2–S_3
	M	620	140	150	3.600		F_2–S_3
	M	620	130	145	3.200		F_1–S_3
	M	620	130	135	3.000		F_2–S_3
	M	600	120	150	2.800		
	M	600	120	145	3.400		
	M	600	120	145	3.200		F_2–S_3
	M	580	120	140	3.000		F_2–S_3
	M	570	120	135	2.700		F_2–S_3
	M	560	110	130	2.500		F_2–S_3
	M	530	110	130	2.200		F_2–S_2
	M	530	95	120	2.100		
		570	100	130	2.700		
3	F	600	125	145	3.100	60	F_2–S_3
	F	580	110	140	3.200	70	F_1–S_3
	F	580	110	130	2.800	130	F_2–S_3
	F	570	100	135	2.800	90	F_1–S_3
	F	570	100	115	2.500	90	F_2–S_3
	F	560	105	125	2.600	50	F_1–S_3
	F	555	100	135	2.600	70	F_2–S_3
	F	550	100	130	2.500	100	F_2–S_3
	F	545	95	135	2.300	60	F_2–S_3
	F	540	95	120	2.300	80	F_2–S_3

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age
	F	535	110	135	2.400	50	F_2–S_3
	F	510	100	115	1.800	20	F_2–S_2
	M	600	110	130	2.800	20	F_2–S_2
	M	550	110	130	2.400	80	F_2–S_3
	M	535	100	120	2.100	110	F_2–S_3
	M	610	115	140	3.400		F_2–S_3
	M	605	120	140	3.000		F_2–S_3
	M	590	110	135	3.100		F_1–S_3
	M	580	120	155	3.300		F_2–S_3
	M	575	110	130	2.700		F_2–S_3
	M	545	105	135	2.500		F_2–S_2
4	F	595	110	130	3.000		F_2–S_3
	F	580	110	145	2.900		F_2–S_3
	F	570	100	130	2.600		F_1–S_3
	F	565	105	130	2.700		F_2–S_3
	F	560	105	135	2.700		F_2–S_3
	F	560	100	130	2.500		F_1–S_3
	F	555	100	130	2.400		F_2–S_3
	F	550	100	130	2.400		F_2–S_3
	F	540	100	130	2.400		F_1–S_3
	F	540	100	130	2.300		F_1–S_3
	F	535	90	125	2.200		F_1–S_3
	F	525	90	125	2.300		F_2–S_2
	M	585	115	140	2.900		F_1–S_3
	M	560	110	130	2.500		F_1–S_3
	M	555	110	135	2.400		F_2–S_3
	M	550	110	130	2.400		F_1–S_3
	M	545	100	120	2.100		F_2–S_3
	M	530	110	120	2.300		F_2–S_3
	M	520	90	115	1.800		F_1–S_3
5		625	135	155	3.600		F_2–S_3
		580	120	150	3.400		
		570	100	140	3.000		F_2–S_3
		570	100	130	2.700		
		570	100	130	2.400		F_2–S_3
		565	110	140	3.000		F_1–S_3
		560	105	150	2.900		
		555	100	120	2.300		F_2–S_3
		550	110	140	2.500		F_2–S_3
		550	100	120	2.300		F_1–S_3
		530	100	130	2.300		F_2–S_2

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age
		530	100	125	2.000		
		510	90	110	1.700		F_2–S_2
		480	85	110	1.600		
6	F	600	125	150	3.500	334	
	F	600	100	140	3.200	215	F_2–S_3
	F	588	124	147	3.100	116	F_1–S_3
	F	588	123	145	3.200	199	F_1–S_3
	F	579	122	136	2.600	87	F_2–S_3
	F	560	100	135	2.900	139	F_1–S_3
	F	560	100	130	2.300	127	F_1–S_3
	F	550	105	130	2.600	97	F_2–S_3
	F	540	100	135	2.400	98	F_1–S_3
	F	530	100	120	2.400	135	F_2–S_2
	F	530	95	130	2.100	13	F_1–S_3
	F	580	100	130	2.800		F_2–S_3
	M	600	120	150	3.500	24	F_2–S_3
	M	580	125	150	3.700	118	
	M	531	118	122	2.200		F_1–S_3
		580	105	140	3.000		F_2–S_3
		545	110	130	2.500		F_2–S_2
		520	100	120	1.800		F_1–S_3
		510	90	115	2.000		F_1–S_2
		505	95	110	1.900		F_2–S_2
7	M	650	130	150	3.800	88	F_2–S_3
	M	645	120	150	4.000	27	F_2–S_3

Table 28. (Continued)

2. Chum salmon, シロザケ

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age	S. P.
1	F	602	127	141	3.100	95	4	A
	F	601	138	148	3.400	55	4	A
	F	598	126	138	3.300	131	4	A
	F	579	126	142	3.000	90	4	A
	F	575	113	135	3.100	87	4	D
	F	572	128	148	3.200	30	4	C D
	F	568	130	110	2.500	42	4	B
	F	562	114	127	2.600	95	5	C
	F	560	122	137	2.900	110	4	A
	F	559	109	133	2.600	130	4	A

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age	S. P.
	F	550	114	124	2.400	30	4	A
	F	543	110	119	2.300	27	4	A
	F	503	117	113	2.100	12	4	A
	M	608	157	136	3.400	17	5	A
	M	588	125	140	3.100	113	4	A
	M	569	110	113	2.200	16	4	A
	M	546	107	127	2.500	61	4	A
	M	524	118	127	2.200	40	4	A
	M	508	128	135	2.900	50	4	A
		591	133	142	3.200		4	A
2	F	600	110	140	3.100	120	5	D
	F	590	130	145	3.100	180	5	A
	F	590	115	140	3.100	95	5	A
	F	580	115	150	3.600	125	5	A
	F	570	120	140	2.600	120	4	A
	F	570	110	135	3.300	95	5	A
	F	560	110	130	2.600	130	4	A
	F	550	110	120	2.200	50	4	C
	F	550	105	130	2.500	135	5	A
	F	535	100	130	2.300	65	4	A
	M	620	130	145	3.300	190	5	A
	M	595	130	145	3.100	20	4	A
	M	585	120	135	2.700	35	4	C
	M	580	140	145	2.900	50	5	A
	M	580	125	130	1.700	90		
	M	580	120	130	2.600	60	5	A
	M	565	130	130	2.400	45	4	A
	M	520	110	110	1.800	15	5	A
	M	570	120	150	3.100		4	A
	M	565	105	135	2.900		4	A
3	F	605	110	140	3.100	140	4	A
	F	590	120	145	2.900	120	4	A
	F	580	120	145	2.900	120	4	A
	F	575	110	130	2.600	140	4	A
	F	575	105	120	2.400	130		
	F	575	100	125	2.400	150	4	A
	F	540	100	110	2.100	80	4	A
	F	540	90	125	2.400	60	4	A
	F	535	100	115	2.100	80	5	A
	F	565	105	125	2.600		4	A
	M	635	140	155	3.700	100	5	A

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age	S. P.
	M	620	140	150	3.700	140	4	A
	M	615	130	145	3.300	80	5	A
	M	580	115	130	2.500	60	4	A
	M	560	100	125	2.300	100	5	A
	M	600	120	135	3.000		4	C D
	M	570	115	120	2.300		5	A
	M	545	110	125	2.200		4	A
	M	535	100	110	1.900		5	B
	M	500	95	110	1.700		4	A
4	F	585	110	130	2.600	80	4	A
	F	575	105	140	2.900	200	5	A
	F	565	115	125	2.500	90	4	A
	F	550	110	130	2.400	75	4	A
	F	540	105	115	2.000	20	4	A
	F	540	90	115		75	4	A
	F	535	100	115	1.900	10	4	A
	F	520	110	140	2.900	85		
	F	520	100	115	1.900	10	4	A
	F	520	100	110	1.800	10	4	A
	F	510	90	120	1.900	25	4	A
	F	505	100	120	1.900	80	4	A
	M	590	120	135	2.700	35	5	A
	M	585	125	150	3.100	70	4	A
	M	570	100	130	2.400	95	4	A
	M	560	110	135	2.500	155	4	A
	M	555	105	125	2.700	65	4	A
	M	530	110	115	1.900	35	4	A
	M	530	100	130	2.100	50	4	A
	M	515	100	105	1.700		4	A
5	F	570	115	130	2.500	95	4	A
	F	520	100	115	1.900	120	4	A
	F	510	110	105	1.800	10	4	A
	M	555	100	125	2.300	78	4	A
		560	105	140	2.700		4	A
		560	100	130	2.600		5	A
		540	90	115	2.100		4	A
		535	110	115	2.000		4	A
		535	100	120	2.300			
		530	115	120	2.000		4	A
		530	110	105	1.800		4	A
		530	100	110	1.800		4	A

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age	S. P.
		520	95	110	1.700		4	A
		510	100	110	1.700		4	A
		510	100	110	1.700			
		505	100	110	1.800		4	A
		505	95	115	1.800		4	A
		500	100	110	1.600		4	A
		490	100	115	1.700		4	A
		480	90	110	1.500		4	A
6	F	600	115	150	3.700	141	5	A
	F	600	115	140	3.500	177	4	A
	F	560	110	130	2.600	171	4	C D
	F	560	105	120	2.700	202	4	A
	F	540	105	115	2.200	13	4	D
	F	522	115	119	1.900	112	4	A
	F	500	100	100	1.600	10	4	C D
	M	610	125	130	3.200	96	4	C D
	M	580	115	125	2.900	103	4	A
	M	580	110	110	2.700	8	4	A
	M	570	105	130	2.500	50	4	A
	M	560	115	130	2.500	81	4	A
	M	545	100	120	2.500	17	4	A
	M	530	110	130	2.200	49	4	A
	M	530	105	120	2.100	80	4	A
	M	520	100	110	1.800	70	4	A
		580	100	110	1.900		4	A
		525	100	110	1.600		5	A
		515	100	110	1.600		5	A
		500	100	110	1.700		4	A
7	F	610	115	140	3.200	147	5	A
	F	600	110	130	3.200	214	4	A
	F	595	110	130	3.000	224	5	A
	F	590	105	135	2.800	156	4	A
	F	590	100	135	3.200	125	4	A
	F	580	105	135	2.900	134	4	A
	F	575	115	120	2.500	40	5	A
	F	570	105	140	3.100	161	4	A
	F	570	100	130	3.000	190	4	A
	F	565	100	140	2.900	176	4	A
	F	555	100	145	2.800	194	5	A
	F	550	100	130	2.700	191	4	A
	F	535	90	115	1.900	174	4	A

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)	Age	S. P.
	M	590	120	140	3.400	98	5	A
	M	590	110	130	3.100	20	4	A
	M	580	115	135	3.100	55	4	A
	M	560	110	125	2.600	28	4	A
	M	520	100	110	2.000	80	4	A
	M	550	100	115	2.000		4	A
	M	510	110	115	1.900		4	A

Table 28. (Continued)

3. Pink salmon, カラフトマス

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)
1	F	497	107	119	1.900	60
	F	494	111	107	1.700	42
	F	483	106	105	1.600	33
	M	505	107	116	1.800	40
	M	487	101	108	1.800	125
	M	485	98	120	1.900	40
	M	459	102	107	1.500	28
		541	120	90	1.600	
		512	104	121	2.100	
		496	102	112	1.700	
		492	104	114	1.700	
		486	105	103	1.500	
		477	98	104	1.500	
2	F	490	90	120	1.600	80
	F	480	100	120	1.500	55
	M	505	100	120	1.800	45
	M	500	110	120	1.700	45
	M	500	100	120	1.300	50
	M	500	100	120	1.200	18
	M	495	95	120	1.400	25
	M	490	100	115	1.700	35
	M	490	85	115	1.500	20
	M	480	100	120	1.600	95
	M	475	95	110	1.400	60
	M	475	95	110	1.400	50
	M	470	100	120	1.100	45
	M	470	90	110	1.500	40
	M	470	70	105	1.300	40

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)
	M	460	100	115	1.500	55
	M	460	95	105	1.400	75
	M	460	90	115	1.400	65
	M	455	90	110	1.400	60
	M	455	70	100	1.500	
	M	500	95	135		
	M	480	95	105	1.500	
3	F	475	90	110	1.600	80
	M	530	100	130	2.400	50
	M	515	95	130	2.000	10
	M	510	90	120	1.800	10
	M	505	90	105	1.700	30
	M	500	100	110	1.800	35
	M	495	105	115	1.800	60
	M	490	95	110	1.700	40
	M	490	95	110	1.600	55
	M	490	90	110	1.600	40
	M	480	95	110	1.500	60
	M	480	90	110	1.600	80
	M	470	85	100	1.400	60
	M	465	90	110	1.300	30
	M	460	95	120	1.600	80
	M	460	90	110	1.500	70
	M	455	90	100	1.200	75
	M	455	85	110	1.200	60
	M	450	90	105	1.300	70
	M	450	85	105	1.300	60
4	F	465	80	95	1.200	80
	M	530	110	125	2.000	20
	M	510	100	120	1.900	10
	M	505	95	125	1.800	30
	M	500	95	120	1.900	70
	M	500	90	130	2.000	20
	M	500	90	120	1.900	65
	M	495	95	115	1.800	20
	M	495	95	110	1.700	50
	M	490	90	120	1.600	40
	M	495	90	115	1.700	40
	M	485	90	115	1.600	20
	M	480	90	110	1.700	50
	M	470	90	110	1.400	50

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)
	M	470	90	100	1.400	35
	M	465	85	110	1.900	50
	M	460	90	110	1.500	75
	M	460	85	105	1.300	30
	M	455	70	100	1.300	44
5		515	100	110	1.800	
		510	110	140	1.900	
		510	95	125	1.900	
		505	95	125	2.000	
		500	100	135	1.900	
		500	100	115	1.800	
		495	100	125	1.900	
		490	100	110	1.500	
		490	95	125	1.800	
		490	95	115	1.700	
		490	90	115	1.700	
		485	90	115	1.800	
		485	85	110	1.500	
		480	95	115	1.700	
		480	95	105	1.500	
		480	90	110	1.500	
		475	100	115	1.700	
		475	90	110	1.500	
		470	95	100	1.400	
		470	90	110	1.500	
6	F	450	80	105	1.500	63
	M	520	100	130	2.300	94
	M	508	108	117	1.700	73
	M	495	90	115	1.400	61
	M	490	95	110	1.600	72
	M	480	90	110	1.500	42
	M	480	90	105	1.500	44
	M	480	90	100	1.600	34
	M	470	95	110	1.200	52
	M	470	90	115	1.500	62
	M	470	90	110	1.400	66
	M	470	90	100	1.400	61
	M	470	90	100	1.300	73
	M	465	90	110	1.400	64
	M	460	90	105	1.200	67
	M	450	85	95	1.400	52

(Continued)

No. of fishing	Sex	F. L. (mm)	H. L. (mm)	B. H. (mm)	B. W. (g)	G. W. (g)
	M	445	80	105	1.500	64
	M	495	100	110	1.600	
7	F	510	90	120	1.900	116
	F	500	80	105	1.600	99
	F	495	80	110	1.700	129
	M	540	110	135	2.300	128
	M	540	105	130	2.200	90
	M	535	95	125	2.000	86
	M	525	100	120	2.100	72
	M	520	105	125	2.000	91
	M	520	105	120	1.900	123
	M	520	100	135	2.100	78
	M	515	95	90	1.900	87
	M	510	90	110	1.600	78
	M	505	95	120	1.700	81
	M	495	95	115	1.700	56
	M	495	90	115	1.800	85
	M	490	100	120	1.800	96
	M	490	95	115	1.700	95
	M	490	90	110	1.800	72
	M	490	90	110	1.700	81
	M	480	90	110	1.500	62
	M	465	90	115	1.500	91

18. Data on Stomach Contents of Salmon
(鮭鱒胃内容物記録)

The stomach samples were taken from the fish immediately after they were hauled on the deck, and stored in formalin liquid without delay. However, materials were gathered from fish specimens which were subjected to the measurement of meristic characters, and no selection was made to collect the materials only from fish which were still alive, i.e., the fish supposed to be captured just before the haul. Accordingly, some of fish which were caught in the gill-net in the evening might have been laid on the net in the water for more than 10 hours until they were hauled on the deck in the morning of the next day. In examining the samples it was found that in most of stomachs their contents had been greatly digested, remaining only as identifiable or undistinguishable fragments of organisms or as amorphous muculent substances. In the table digestibility is roughly shown by symbols, A, B and C, in order from high degree to low degree.

Stomach contents were weighed with major distinguishable groups separately.

Their wet weight determination was made after removing water from them by rolling them on the blotting paper.

Sampling of stomachs was made by R. Maeda.

Measurement was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

Table 29. Data on stomach contents of salmon in 1955 cruise to the Bering Sea

No. of fishing	Fish from which stomachs were sampled: Species	Sex	Fork length (cm)	Body weight (gr)	Stomach contents (gr) (Parentheses mean individual number): Digestibility	Adult or young fish	Fish-larva	Squid-larva	Euphausiid	Amphipod	Unidentified fragments and mucus	Total
2	Chum salmon (シロザケ)	♀	50.3	2100	A						1.8	1.8
	〃	〃	57.2	3200	A						1.1	1.1
	〃	〃	54.3	2300	B				0.1		5.2	5.3
	〃	〃	59.8	3300	A						1.1	1.1
	〃	〃	56.2	2600	A						1.0	1.0
	〃	〃	57.9	3000	A						1.0	1.0
	〃	〃	55.0	2400	A						1.0	1.0
	〃	〃	55.9	2600	A						0.5	0.5
	〃	〃	57.5	3500	A						1.4	1.4
	〃	〃	56.0	2900	A						1.0	1.0
	〃	〃	60.2	3100	B				0.1		2.7	2.8
	〃	♂	56.8	2900	A						2.3	2.3
	〃	〃	58.8	3100	A						3.1	3.1
	〃	〃	52.4	2200	A						27.0	27.0
	〃	〃	56.9	2200	A						16.3	16.3
	〃	〃	54.6	2500	A						2.0	2.0
	Humpback salmon (マス)	♀	49.7	1900	B					0.3		0.3
	〃	♂	48.7	1800	A						1.7	1.7
	〃	〃	48.5	1900	B					0.8	7.6	8.4
6	Chum salmon (シロザケ)	♀	55.2	1900	A						19.2	19.2
	〃	〃	54.0	2200	A						3.6	3.6
	〃	〃	60.0	3500	A						24.3	24.3
	〃	〃	56.0	2700	B		20.3					20.3
	〃	〃	60.0	3700	A						25.5	25.5
	〃	〃	56.0	2600	A						2.5	2.5
	〃	〃	50.0	1600	A						4.7	4.7
	〃	♂	61.0	3200	B		0.3				11.0	11.3
	〃	〃	52.0	1800	A						1.3	1.3
	〃	〃	56.0	2500	A						0.9	0.9
	〃	〃	53.0	2200	A						28.1	28.1
	〃	〃	54.5	2500	A						11.4	11.4
	〃	〃	53.0	2100	A						7.6	7.6
	〃	〃	58.0	2900	A						0.7	0.7
	〃	〃	57.0	2500	A						10.7	10.7
	〃	〃	58.0	2700	A						12.5	12.5

(Continued)

No. of fishing	Fish from which stomachs were sampled				Stomach contents (gr) (Parentheses mean individual number)							
	Species	Sex	Fork length (cm)	Body weight (gr)	Digestibility	Adult or young fish	Fish-larva	Squid-larva	Euphausiid	Amphipod	Undetermined organisms and mucus	Total
	Chum salmon (シロザケ)	Uncertain	58.0	1900	A						5.7	5.7
	〃	〃	51.5	1600	A						12.8	12.8
	〃	〃	52.5	1600	A						10.6	10.6
	〃	〃	50.0	1700	A						4.6	4.6
	Sockeye salmon (ベニザケ)	♀	58.8	3200	A						0.9	0.9
	〃	〃	58.0	3100	Empty							0
	〃	〃	57.9	2600	B		0.2					0.2
	〃	〃	60.0	3500	B		0.2				1.5	1.7
	〃	〃	55.0	2600	A						0.2	0.2
	〃	〃	53.0	2100	A						1.2	1.2
	〃	〃	56.0	2900	A						0.4	0.4
	〃	〃	60.0	3200	A						0.2	0.2
	〃	〃	53.0	2400	Empty							0
	〃	〃	58.0	2800	B	8.7(1)						8.7
	〃	〃	54.0	2400	A						3.5	3.5
	〃	♂	47.0	1400	A						0.9	0.9
	〃	〃	58.0	3700	A						14.5	14.5
	〃	〃	60.0	3500	B					0.1		0.1
	〃	Uncertain	50.5	1900	A						3.0	3.0
	〃	〃	51.0	2000	A						0.8	0.8
	Humpback salmon (マス)	♂	50.8	1700	C		5.5				0.3	5.8
	〃	〃	49.0	1600	B		1.8					1.8
	〃	〃	47.0	1500	B		1.4				1.4	2.8
	〃	〃	47.0	1200	B		1.9					1.9
	〃	〃	49.5	1400	B		1.8					1.8
	〃	〃	44.5	1500	B		2.7					2.7
	〃	〃	49.5	1600	B		8.0					8.0
	〃	〃	46.0	1200	A						0.2	0.2
	〃	〃	47.0	1300	A						0.3	0.3
	〃	〃	47.0	1400	B		1.1				0.5	1.6
	〃	〃	55.0	1400	C		2.4	0.2			0.1	2.7
	〃	〃	48.0	1500	A						0.3	0.3
	〃	〃	52.0	2300	B	2.1						2.1
	〃	〃	48.0	1500	B					0.1	5.0	5.1

A: Nearly all have been digested.
B: Digestion proceeded to a certain extent.
C: Slightly digested.

19. Sight Records of Sea-Birds, Whales, etc.
(海鳥鯨等目視観察記録)

Objects in sight at sea are: (not approved by specialist)

Shearwaters: (ミズナギドリ類)

Puffinus leucomelas, Streaked shearwater, オオミズナギドリ
P. griseus, Sooty shearwater, ハイイロミズナギドリ
P. tenuirostris, Slender-billed shearwater, ハシボソミズナギドリ

Storm petrels: (ウミツバメ類)

Oceanodroma leucorhoa leucorhoa, Leach's fork-tailed petrel, コシジロウミツバメ
O. furcata, Grey fork-tailed petrel, ハイイロウミツバメ

Auks: (ウミスズメ類)

Aethia cristatella, Crested auk, エトロフウミスズメ
Phaleris pusilla, Least auk, コウミスズメ
Synthliboramphus antiquus, Ancient auk, ウミスズメ

Guillemots: (ウミガラス類)

Uria columba columba, Pigeon guillemot, ウミバト
U. aalge inornata, Bering Island guillemot, ウミガラス, ロツペンチヨウ

Puffins:

Lunda cirrhata, Tufted puffin, エトピリカ, オロロンチヨウ
Fratercula corniculata, Horned puffin, ツノメドリ

Skuas: (トウゾクカモメ類)

Stercorarius parasiticus parasiticus, Arctic skua, クロトウゾクカモメ

Albatrosses: (アホウドリ類)

Diomedea nigripes, Black-footed albatross, クロアシアホウドリ

Gulls: (カモメ類)

Larus crassirostris, Japanese gull, black-tailed gull, ウミネコ
L. occidentalis, Western gull
L. schistisagus, Slaty-backed gull, オオセグロカモメ
L. argentatus vegae, Vega herring gull, セグロカモメ

Plovers: (チドリ類)

Snipes: (シギ類)

Wild geese: (ノガモ類)

Migrant land birds: (陸鳥迷鳥)

Phylloscopus puscatus puscatus, Brown bush-warbler, ムジセツカ

Whales: (鯨類)

Balaenoptera physalus, Common rorqual, finback, ナガスクジラ
B. musculus, Sulphur bottom, blue whale, シロナガスクジラ
Physeter catodon, Sperm whale, cachalot, マツコウクジラ

Marine mammals other than whales: (海獣類)

Eumetopias jubatus, Northern sea lion, トド
Callorhinus ursinus, Northern fur seal, オツトセイ
Phocaenoides dallii, Northern porpoise, キタイルカ

Table 30. Sight records of sea-birds, whales, etc. in 1955 cruise to the Bering Sea and northern North Pacific

(Reprinted from "Motoda & Fujii, 1956. Bull. Fac. Fish., Hokkaido Univ. Vol. 6, No. 4")

Date	Hour (Ship's time)	Position	Regions	Weather	Air temp. (C)	Sea surface temp. (C	Objects in sight	Observer
June 22	1900	42-24N, 145-57E	Off Hokkaido	r	8.5	8.3	3 whales	S. Abe
23	0730	42-26N, 149-21E	〃	o	7.9	6.8	5 porpoises	S. Motoda & K. Kobayashi
〃	1245	43-17N, 149-08E	〃	b c	9.0	9.1	1 fur seal	K. Masuda
〃	2300	44-16N, 150-19E	Off Kuriles	b c	7.2	8.4	Wake prominently luminescent, very fine particles	S. Motoda
24	0850	45-28N, 151-56E	〃	c	6.8	6.2	2 sperm whales	S. Abe
〃	0930	45-29N, 151-58E	〃	c	6.8	6.2	6-7 sperm whales	S. Saito
〃	1230	45-54N, 152-30E	〃	d	5.6	3.8	3 porpoises	K. Masuda
〃	1345	45-58N, 152-35E	〃	d	6.1	5.5	1 whale (not sperm whale)	K. Masuda
25	0635	47-45N, 154-56E	〃	o	5.3	5.4	5-6 porpoises	S. Nishiyama
〃	1900	49-20N, 157-57E	〃	c	5.0	6.2	3 whales, more than 10 porpoises	S. Abe
〃	2000	49-26N, 157-19E	〃	c	4.9	5.3	Russian whale catcher boat	T. Fujii
〃	2200	49-46N, 157-39E	〃	o	4.3	6.2	Wake prominently luminescent	S. Motoda
26	0300	50-19N, 158-26E	〃	o	4.0	6.4	1 streaked shearwater, 5-6 Bering Island guillemots	A. Togashi
〃	0830	50-38N, 158-50E	〃	f	3.9	6.1	2 pigeon guillemots, 1 crested auk	A. Togashi
〃	0900	50-48N, 159-06E	〃	f	4.0	5.4	1 brown bush-warbler, migrant	A. Togashi
〃	2030	51-43N, 160-30E	Off Kamchatka	f	4.1	6.2	Flocks of Leach's fork-tailed petrels	A. Togashi
27	0300	51-50N, 160-33E	〃	f	4.0	5.8	2 slender-billed shearwaters, 5-7 sooty shearwaters	A. Togashi
〃	0600	51-55N, 160-43E	〃	f	5.0	5.9	2 slaty-backed gulls, 2 pigeon guillemots	A. Togashi
〃	1310	52-46N, 161-58E	〃	b c	9.9	6.8	3 whales (not sperm whales)	K. Masuda
〃	1700	52-32N, 162-05E	〃	b c	7.0	6.2	Bering Island guillemots, black-tailed gulls, slender-billed shearwaters	S. Motoda
28	0300	52-56N, 162-41E		b c	7.2	6.2	Sooty shearwaters, slender-billed shearwaters, slaty-backed gulls	A. Togashi
〃	0700	52-59N, 162-55E		b c	9.1	7.0	1 pigeon guillemot	A. Togashi
29	1800	53-00N, 168-00E		c	5.9	5.9	1 slaty-backed gulls, Bering Island guillemots	A. Togashi
〃	1930	53-00N, 168-00E		c	6.1	5.3	1 Leach's fork-tailed petrel, 5 Bering Island guillemots	A. Togashi
30	0500	53-00N, 167-55E		f	5.5	5.2	3 shearwaters, 1 streaked shearwater	A. Togashi
〃	1200	53-00N, 169-34E		o	5.9	5.4	3 slaty-backed gulls	A. Togashi
〃	1830	52-55N, 169-40E	Near Attu I.	c	5.2	5.9	1 Bering Island guillemot	A. Togashi
July 1	0600	52-41N, 170-08E	〃	f	4.6	5.2	Tufted puffins	S. Motoda
〃	0800	52-45N, 170-06E	〃	f	5.2	5.1	2 sperm whales	S. Abe
〃	1400	53-04N, 172-08E	〃	o	6.6	5.5	2-3 whales	K. Masuda
〃	1800	57-28N, 170-02W	〃	f	6.0	6.1	12 fur seals and 1 sea lion during 30 minutes	S. Abe
〃	2200	57-27N, 168-42W	〃	o	6.2	5.9	Luminescence of plankton, indistinct	S. Motoda
20	0800	54-17N, 164-19W	Near Unimak I.	b c	9.3	8.9	1 tufted puffin, many pigeon guillemots, many fork-tailed petrels	A. Togashi
〃	1400	54-12N, 164-45W	Unimak Pass	f	8.6	6.4	5-7 plovers, many grey fork-tailed petrels, many shearwaters, many vega herring gulls, many pigeon guillemots, many tufted puffins, 1 wild goose, 1 auk, gulls, many fur seals, ca 30 groups of sea lions ; a group composed of 10-30 individuals	K. Masuda & A. Togashi
〃	1900	54-33N, 164-35W	Off the south of Unimak I.	f	9.5	9.0	Fur seals frequently, many bull kelps, many jelly fish, luminescence of considerable size, but luminescence in wake indistinct	S. Motoda
21	2200	52-18N, 160-21W	North Pacific	f	11.0	10.2	Luminescence of plankton, indistinct	S. Motoda
22	0800	52-34N, 157-42W	〃	f	11.2	10.4	Black-footed albatrosses, tufted puffins	S. Motoda
〃	1900	52-18N, 153-42W	〃	c	10.3	9.5	Luminescence of plankton, indistinct	S. Motoda
23	2200	52-36N, 147-30W	〃	f	10.0	10.1	Luminescence of plankton, indistinct	S. Motoda
24	0800	52-33N, 144-59W	〃	o	9.3	10.0	5-6 black-footed albatrosses	S. Motoda
〃	2200	51-41N, 140-17W	〃	o	11.0	10.5	Luminescence of plankton, indistinct	S. Motoda
25	0800	51-24N, 135-45W	〃	b c	12.3	11.2	5-3 black-footed albatrosses	S. Motoda

Table 30. (Continued)

Date	Hour (Ship's time)	Position	Regions	Weather	Air temp. (°C)	Sea surface temp. (°C)	Objects in sight	Observer
July 3	0500	55-54N, 169-10E	Off Komandorskii Is.	o	4.8	5.0	1 fur seal, 1 tufted puffin, 3 vega herring gulls, 1 shearwater, 1 fork-tailed petrel	A. Togashi
〃	0630	55-58N, 169-10E	〃	o	4.8	5.0	3 horned puffins	A. Togashi
5	0600	58-43N, 168-00E	Off Oliutorsk	o	5.0	5.0	No bird	A. Togashi
〃	1900	58-34N, 170-45E	〃	f	5.2	4.3	5-6 shearwaters, 2 gulls	A. Togashi
6	0600	58-46N, 173-30E		o	3.8	4.4	1 fur seal, 1 sea lion, 7 sooty shearwaters, 2 gulls	A. Togashi
7	0600	56-48N, 173-16E		f	4.5	5.0	No bird	A. Togashi
8	0600	53-59N, 173-17E	Near Attu I.	o	5.5	5.4	10 shearwaters	A. Togashi
〃	2200	53-02N, 176-01E	Near Kiska I.	o	5.3	4.9	Luminescence of plankton, indistinct	S. Motoda
9	0430	52-50N, 176-58E	Bower's Bank	o	5.0	5.0	1 sperm whale	S. Nishiyama
〃	2200	52-31N, 178-53W	〃	o	5.8	5.6	Tufted puffins	S. Motoda
11	0900	55-34N, 178-48W	〃	b	9.0	6.1	Flocks of grey fork-tailed petrels, sooty shearwaters and slender-billed shearwaters	S. Motoda
〃	2000	57-00N, 178-58W	〃	b c	7.2	6.4	Bulk of small young squids in fish-larva net	K. Kobayashi
12	0900	58-19N, 178-43W		o	6.3	6.8	Flocks of grey fork-tailed petrels and sooty shearwaters	S. Motoda
14	0900	57-17N, 172-00W		o	6.1	6.3	Many pigeon guillemots and tufted puffins	S. Motoda
〃	1650	57-27N, 170-11W	Near Pribilof Is.	f	5.8	6.2	Fur seals, pigeon guillemots	K. Kobayashi & R. Maeda
July 26	0800	50-36N, 133-57W	North Pacific	o	12.2	12.3	1 leach's fork-tailed petrel, 1 wild goose, 1 snipe, 4 black-footed albatrosses	A. Togashi
27	0800	49-56N, 128-16W	Off Vancouver I.	c	14.0	13.9	More than 10 black-footed albatrosses	S. Motoda
August 8	1600	47-59N, 123-18W	Juan de Fuca Str.	b	12.8	10.5	5-6 white gulls	S. Motoda
9	0800	48-27N, 126-32W	Off Vancouver I.	b	14.0	13.6	5-6 white gulls, 2 black-footed albatrosses follow the ship	S. Motoda
10	0800	48-39N, 131-56W	North Pacific	o	13.5	14.0	No gull, 2-3 black-footed albatrosses follow the ship	S. Motoda
11	0800	48-45N, 136-44W	〃	o	11.8	12.1	Petrels, black-footed albatrosses follow the ship	S. Motoda
12	0800	48-23N, 141-48W	〃	o	12.0	12.6	12 black-footed albatrosses follow the ship	S. Motoda
13	0800	47-55N, 146-10W	〃	o	12.8	12.1	Black-footed albatrosses follow the ship	S. Motoda
14	0800	47-12N, 150-19W	〃	o	11.2	13.0	Black-footed albatrosses follow the ship	S. Motoda
〃	1700	46-39N, 152-33W	〃	o	12.5	13.7	Sunfish basking at the surface	S. Nishiyama
15	0800	46-10N, 155-00W	〃	f	14.5	14.9	Black-footed albatrosses follow the ship	S. Motoda
16	0800	45-28N, 159-35W	〃	f	17.5	16.8	Black-footed albatrosses follow the ship	S. Motoda
〃	1150	45-22N, 160-18W	〃	o	16.7	16.9	5-6 finback whales	S. Abe
17	0800	44-32N, 164-03W	〃	o	16.0	18.1	6-7 black-footed albatrosses follow the ship	S. Motoda
〃	1540	44-32N, 165-30W	〃	o	15.8	18.3	1 sperm whale	S. Nishiyama
18	0800	43-31N, 169-03W	〃	o	16.6	19.4	Black-footed albatrosses follow the ship	S. Motoda
〃	1600	43-13N, 169-43W	〃	c	18.2	20.4	5-6 sperm whales	S. Nishiyama
〃	1600	43-13N, 169-43W	〃	c	18.2	20.4	Lantern fish flying onto the deck	K. Kobayashi
〃	1730	43-11N, 171-02W	〃	c	17.9	19.9	5-6 porpoises	S. Nishiyama
〃	1743	43-11N, 171-05W	〃	c	17.8	19.6	Swordfish (?)	S. Nishiyama
19	0800	43-07N, 174-10W	〃	b c	19.0	19.1	Black-footed albatrosses follow the ship, Streaked shearwaters	S. Motoda
20	0800	43-08N, 179-08W	〃	c	23.2	21.7	2 black-footed albatrosses at a distance from the ship	S. Motoda
22	0800	43-05N, 175-42E	〃	b c	21.2	21.5	2 black-footed albatrosses at a distance from the ship	S. Motoda
23	0800	42-57N, 171-04E	〃	b c	20.0	20.1	2 black-footed albatrosses at a distance from the ship	S. Motoda
25	0530	42-51N, 162-08E	〃	f	20.0	18.6	1 swordfish, 1 shark	S. Nishiyama
〃	0800	42-50N, 161-38E	〃	f	20.4	18.8	No albatross	S. Motoda
26	1900	42-47N, 154-50E	〃	d	21.5	21.0	Large swarm of *Doliolum* by examining fish-larva net sample	K. Kobayashi
27	0800	42-45N, 152-11E	〃	f	19.0	16.7	No bird	S. Motoda
〃	0950	42-45N, 151-28E	〃	c	19.6	17.4	A group of sperm whales	S. Motoda

Symbols of weather : b. Blue sky c. Cloudy bc. Partly clouded d. Drizzling rain f. Fog o. Overcast

V

1956 CRUISE OF THE "OSHORO MARU" TO THE BERING SEA

おしよろ丸昭和31年度ベーリング海航海

(一部水産庁委託調査)

1. Cruise Report
（航海報告）

Departure from Hakodate	July 10 （函館出港）
Steering back for landing a patient	July 12 （患者揚陸のため釧路へ転針）
Anchoring at Kushiro	July13–14（釧路仮泊）
First hydrographic cast	July 21 （海洋観測開始）
First salmon gill-net set	July 21 （鮭鱒流網開始）
Passed in and out Amchitka Pass	July 29 （アムチトカ水道往復通過）
Last salmon gill-net set	Aug. 4 （鮭鱒流網終了）
First trawling	Aug. 5 （トロール開始）
Last trawling	Aug. 11 （トロール終了）
Passed Amukta Pass	Aug. 13 （アムクタ水道通過）
Last hydrographic cast	Aug. 17 （海洋観測終了）
Arrival at Hakodate	Aug. 26 （函館帰港）
Covered 7679 miles in total 47 days at sea.	（全航程7679浬，航海日数47日）

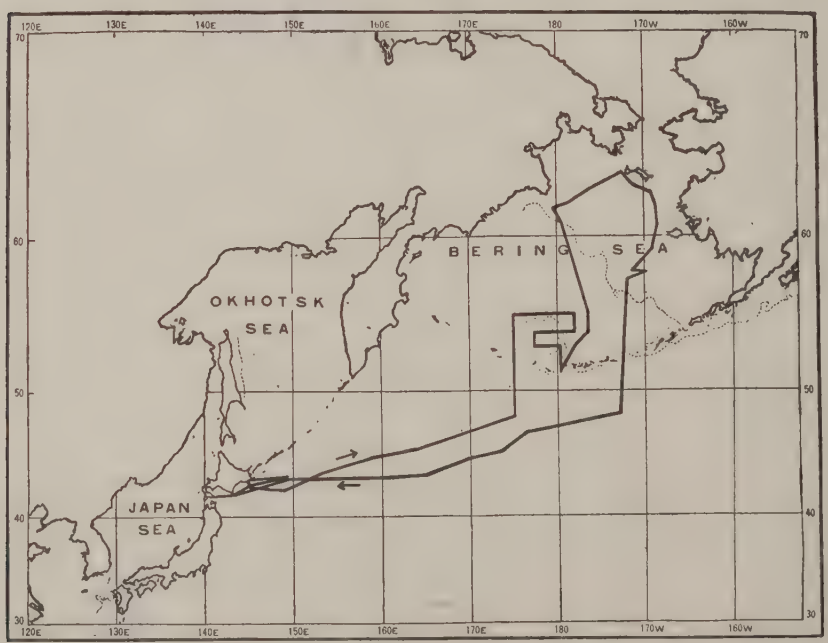

Fig. 16. Track of 1956 cruise of the "Oshoro Maru" to the Bering Sea

2. Members of Staff Aboard
（乗 船 者）

Captain	Takeji Fujii	（船　　長　藤 井 武 治）
Crew（乗組員）		
Chief Officer	Shigeo Abe	（一等航海士　阿 部 茂 夫）
First Officer	Shoji Saito	（次席一等航海士　斎 藤 昭 二）
Second Officer	Noriyoshi Masuda	（二等航海士　増 田 紀 義）
Third Officer	Satoru Nishiyama	（三等航海士　西 山　　悟）
Chief Engineer	Shoichi Tomisawa	（機 関 長　富 沢 正 一）
First Engineer	Kenzo Omi	（一等機関士　尾 見 健 三）
Second Engineer	Ichiro Kataoka	（二等機関士　片 岡 一 郎）
Third Engineer	Tetsusaburo Inomata	（三等機関士　猪 股 鉄三郎）
Chief Wireless Operator	Toshio Kasao	（首席通信士　笠 尾 俊 雄）
Junior Wireless Operator	Mitsuo Kurotori	（次席通信士　黒 鳥 満 雄）
Purser	Akira Togashi	（事 務 長　富 樫　　章）
Doctor	Naotoshi Koide	（船　　医　小 出 直 俊）
and 23 men（外23名）		
Research Men（調査員）		
Professor（Leader）	Ichiro Saito（Fisheries）（団長　教授　斎藤市郎，漁業）	
Assistant Professor	Hideto Koto（Physical oceanography）（助教授　小藤英登，海洋）	
Assistant Professor	Motokazu Ueno（Biology）（助教授　上野元一，生物）	
Lecturer	Ken-ichiro Kyushin（Biology）（講師　久新健一郎，生物）	
Research Assistant	Kiyu Kobayashi（Biology）（助手　小林喜雄，生物）	
Research Assistant	Masaaki Fukuda（Physics）（助手　福田雅明，物理）	
Graduate Student（Nagoya University）		
	Satoru Kanamori（Chemistry）（大学院学生（名大）金森　悟，化学）	
Student in Advanced Course	Masanao Oseko（Biology）（専攻科学生　大迫正尚，生物）	
Student in Advanced Course	Shigeru Katsuki（Physics）（専攻科学生　勝木　茂，物理）	
	Koji Kato（Hydrography）（加藤工二，海洋）	

Cadets（実習生）

27 cadets of Advanced Course of Pelagic Fishery（遠洋漁業特設専攻科学生　27名）

Total 73 persons（総員　73名）

3. Research Committee
（調 査 委 員）

Professor (Coordinator)	Ichiro Saito (Fisheries)（代表　教授　斎藤市郎，漁業）
Professor	Seichi Yamaguchi (Physical oceanography)（教授　山口生知，海洋）
Professor	Sigeru Motoda (Plankton)（教授　元田茂，プランクトン）
Professor	Shin-ichi Sato (Ichthyology)（教授　佐藤信一，魚類）
Professor	Naoichi Inoue (Turbidity, radic-activity)（教授　井上直一，濁度，放射能）
Assistant Professor	Hideto Koto (Physical oceanography)（助教授　小藤英登，海洋）
Assistant Professor	Kenji Kato (Chemistry)（助教授　加藤健司，化学）
Assistant Professor	Tatsuro Kubo (Salmon)（助教授　久保達郎，鮭鱒）
Assistant Professor (Captain)	Takeji Fujii (Fisheries, meteorology)（助教授　藤井武治，漁業，気象）
Lecturer	Ken-ichiro Kyushin (Salmon, bottom fish) （講師　久新健一郎，鮭鱒，底棲魚）

4. Specification of Hydrographic Stations
（海 洋 観 測 地 点）

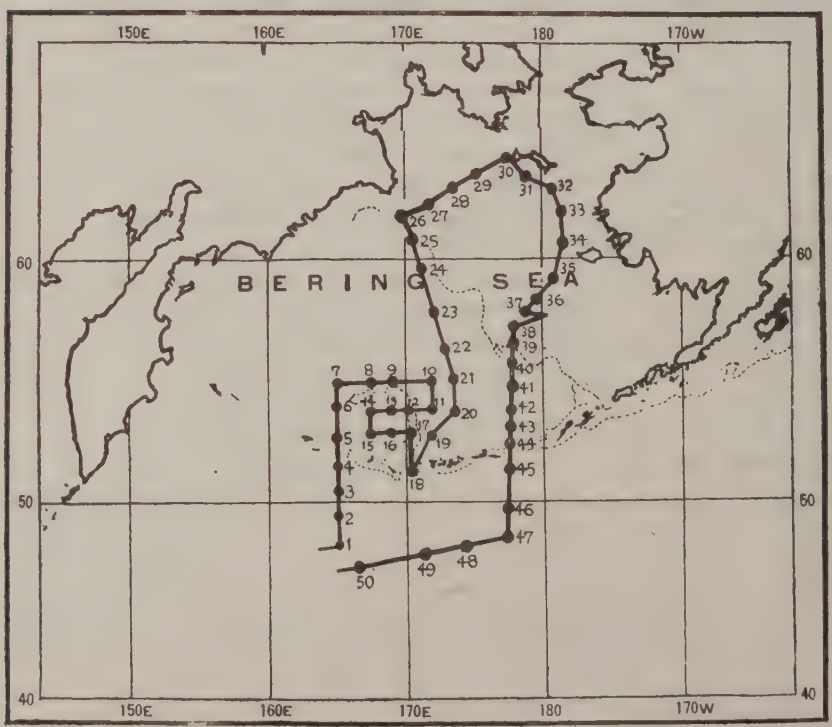

Fig. 17. Hydrographic stations in 1956 cruise of the "Oshoro Maru"

Table 31. Hydrographic stations in 1956 cruise to the Bering Sea

No. of station	Ship's time		Greenwich mean time		Position		Depth of sea bottom determined by echosounding (m)	Maximum depth of cast (m)
	Date	Hour	Date	Hour	Latitude	Longitude		
Os 1	07-21	0300～0700	07-20	1600～2000	N47°-56′	E174°-51′		1335
Os 2	07-21	1857～2000	07-21	0757～0900	N49°-30′	E175°-00′		1100
Os 3	07-22	1124～1237	07-22	0024～0137	N50°-19′	E175°-00′		1280
Os 4	07-23	0607～0700	07-22	1907～2000	N51°-30′	E175°-00′		1425
Os 5	07-23	1415～1523	07-23	0315～0423	N52°-32′	E175°-04′	1000	746
Os 6	07-24	0925～1046	07-23	2225～2346	N53°-50′	E174°-57′		1340
Os 7	07-24	1856～2004	07-24	0756～0904	N55°-00′	E175°-00′		1250
Os 8	07-25	1308～1356	07-25	0208～0256	N55°-00′	E177°-10′		1089
Os 9	07-25	2251～2343	07-25	1151～1243	N55°-00′	E179°-20′		1416
Os 10	07-26	0903～1035	07-25	2103～2255	N55°-02′	W178°-26′		1469
Os 11	07-27	0931～1035	07-26	2131～2235	N53°-32′	W178°-27′		1357
Os 12	07-27	1737～1805	07-27	0537～0605	N53°-40′	W179°-50′	510	395
Os 13	07-27	2352～0042	07-27	1152～1242	N53°-10′	E178°-54′		1500
Os 14	07-28	0651～0739	07-27	1851～1939	N53°-42′	E177°-29′		1499
Os 15	07-28	1708～1754	07-28	0508～0554	N52°-20′	E177°-30′		1481
Os 16	07-29	0004～0059	07-28	1204～1259	N52°-20′	E178°-50′		1289
Os 17	07-29	0700～0733	07-28	1900～1933	N52°-21′	W179°-49′		193
Os 18	07-29	1904～2015	07-29	0704～0815	N51°-00′	W179°-54′		1196
Os 19	07-30	1032～1131	07-29	2232～2331	N52°-24′	W178°-30′		679
Os 20	07-31	0825～1013	07-30	2025～2213	N53°-45′	W176°-20′		1339
Os 21	07-31	2000～2105	07-31	0800～0905	N55°-00′	W176°-20′		2352
Os 22	08-01	1549～1728	08-01	0349～0528	N56°-35′	W177°-18′		1429
Os 23	08-02	1443～1715	08-02	0243～0515	N58°-12′	W178°-16′		1243
Os 24	08-03	0553～0646	08-02	1753～1846	N59°-17′	W179°-17′		1452
Os 25	08-03	1402～1454	08-03	0202～0254	N60°-15′	W179°-56′	1130	979
Os 26	08-03	1938～2032	08-03	0738～0832	N61°-22′	E179°-10′	156	148
Os 27	08-04	1230～1310	08-04	0030～0110	N61°-14′	W178°-28′	145	119
Os 28	08-04	2241～2317	08-04	1041～1117	N62°-10′	W176°-45′	110	97
Os 29	08-05	0526～0549	08-04	1726～1749	N62°-33′	W174°-56′	73	69
Os 30	08-05	1535～1609	08-05	0335～0409	N63°-03′	W172°-54′	70	60
Os 31	08-06	0120～0141	08-05	1320～1341	N62°-38′	W171°-20′	51	47
Os 32	08-06	0800～0825	08-05	2000～2025	N62°-15′	W169°-36′	40	29
Os 33	08-06	1606～1627	08-06	0406～0427	N61°-26′	W168°-58′	38	32
Os 34	08-07	0634～0650	08-06	1834～1850	N60°-20′	W169°-00′	41	34
Os 35	08-08	1442～1455	08-08	0242～0255	N59°-24′	W169°-33′	60	55
Os 36	08-09	0620～0649	08-08	1820～1849	N58°-30′	W170°-41′	79	74
Os 37	08-10	0535～0558	08-09	1735～1858	N58°-08′	W170°-54′	94	80
Os 38	08-11	1222～1248	08-11	0022～0048	N57°-30′	W172°-00′	123	105
Os 39	08-12	0444～0620	08-11	1644～1820	N56°-19′	W172°-01′		1191
Os 40	08-12	1320～1520	08-12	0120～0320	N55°-21′	W172°-00′		1421

(Continued)

No. of station	Ship's time		Greenwich mean time		Position		Depth of sea bottom determined by echosounding (m)	Maximum depth of cast (m)
	Date	Hour	Date	Hour	Latitude	Longitude		
Os 41	08–13	0008～0202	08–12	1208～1402	N54°–10′	W172°–00′		1480
Os 42	08–13	0931～1015	08–12	2131～2215	N53°–00′	W172°–00′		970
Os 43	08–13	1529～1607	08–13	0329～0407	N52°–27′	W172°–00′		388
Os 44	08–13	2019～2207	08–13	0819～1007	N51°–50′	W172°–00′		1373
Os 45	08–14	0400～0505	08–13	1600～1705	N51°–00′	W172°–00′		1140
Os 46	08–14	1520～1729	08–14	0320～0529	N49°–45′	W172°–00′		1115
Os 47	08–15	0255～0455	08–14	1455～1655	N48°–13′	W172°–00′		797
Os 48	08–16	0505～0630	08–15	1705～1830	N47°–38′	W176°–21′		1462
Os 49	08–16	2119～2219	08–16	0919～1019	N47°–10′	W179°–35′		1461
Os 50	08–17	2113～2304	08–17	0913～1104	N46°–10′	E175°–31′		2052

5. Items of Observations and Procedure at Sea
（調 査 項 目 及 海 上 作 業）

Meteorological observations（気象観測）

Every-three-hour interval, covering the whole course.

Measurement of surface temperature（表面水温観測）

Every-hour interval, covering the whole course.

Hydrographic cast（海洋観測）

At 50 stations, covering depths from the surface to usually 1500 metres. The electric hydrographic winch was reconstructed before the cruise to increase the power to 5 H. P., and 2400 metres of steel wire of 2.7 mm diameter were provided.

Analyses of water samples（試水分析）

Chlorinity was estimated after returning from the voyage, dissolved oxygen, phosphate, silicate and hydrogen-ion concentration immediately aboard the ship; some of sample water was stored for later studies on strontium, iodine and other rare metals.

Measurement of submarine illumination（海中照度測定）

By means of suspended luxmeter.（海中照度計使用）

Measurement of light absorption of sea water *in situ*（現場海水の光吸収度測定）

By suspended turbidity-meter.（海中濁度計使用）

Measurement of light scattering by suspended matter（懸濁物による光の散乱度測定）

On the sample water collected with Nansen bottles, measured by means of AKA phototube colorimeter.

Measurement of radio-activity of sea water（海水放射能測定）

Sample water from the surface was brought to the University.

Plankton sampling（プランクトン採集）

With North Pacific Standard Net, 45 cm × 180 cm, made of nylon, having 0.33 mm mesh size, provided with Tsurumi flow-meter, by making vertical haul from 150 metre depth, one haul at every

hydrographic station.

With small twin plankton net, one made of bolting silk, GG 54, 0.33 mm mesh aperture, the other made of bolting silk, XX 13, 0.112 mm mesh aperture, by making vertical haul from 1000 metre depth at six hydrographic stations.

Sampling 300 cc of water from various depths for direct count of phytoplankton cells. The samples were sent to the Hakodate Marine Observatory.

Fish larva net tow (稚魚ネット曳網)

With 130 cm × 450 cm stramin conical net (bolting silk, GG 54, at the posterior portion) by making horizontal tow at the surface for ten minutes at low speed, at every hydrographic station as well as at sun set daily while underway.

Salmon gill-net operation (鮭鱒流網漁業試験)

Eight operations were carried out at different locations.

Trawl fishing (トロール漁業試験)

Twenty operations were carried out in the eastern basin of the Bering Sea.

Measurement of biological characters on fish caught by salmon gill-net fishing and by trawling. (漁獲標本の生物学的測定)

Observations on stomach contents of salmon caught with gill-net (鮭鱒胃内容物観察)

Eye observations and dip-net sampling of saury (サンマ目視観察並にたも網採集)

Eye observations of whales, other marine mammals, etc. (鯨海獣等の目視観察)

6. Data on Meteorological Observations
(気 象 観 測 記 録)

Observations were made under sponsorships of ship's officers at every-three-hour at sea.

Y′Y′: Date and time in Greenwich Mean Time (Universal Time)

Movement of wind direction (dd) and speed (ff) was made by means of aerovane type anemometer set on the top of pole on bridge at the height of 10.5 metres above the sea surface.

Measurement of air temperature (TT) and dew point temperature (TdTd) was made by means of Asmann aspiration dry and wet bulb thermometer set on the upper deck at the height of 5 metres above the sea surface.

$T_tT_tT_t$: Temperature of surface water (00.0 °C).

X: Uncertain.

Table 32. Data on meteorological observations in 1956 cruise to the Bering Sea

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
07 10	2	417	412	06	8	08	15	97	02	2	094	15	8	6	4	×	×	5	07	50	13	12	147
10	2	417	418	09	8	11	09	98	02	2	098	15	8	6	5	0	0	2	04	01	13	11	142
10	2	417	424	12	4	11	09	97	01	1	113	13	4	6	5	×	×	2	15	01	13	11	125
10	2	418	430	15	8	10	15	97	02	2	120	13	8	6	4	×	×	2	07	02	12	10	118
10	2	419	436	18	7	05	04	95	58	2	127	12	6	6	4	5	×	2	07	01	12	10	112
10	2	420	442	21	8	07	02	97	02	2	136	12	8	6	4	5	×	2	09	01	11	07	110
11	2	421	448	00	8	07	05	96	02	4	133	12	8	6	3	×	×	6	03	01	12	09	116
11	2	422	455	03	8	11	03	98	02	2	140	15	8	6	5	×	×	5	07	50	14	11	148
11	2	422	461	06	8	13	06	97	02	2	141	15	8	6	4	×	×	3	01	52	15	13	162
11	2	423	467	09	7	11	08	97	28	2	153	15	7	6	4	×	×	3	12	51	14	11	152
11	2	424	472	12	8	11	05	97	02	2	157	14	8	6	5	×	×	2	04	51	14	11	149
11	2	425	478	15	8	11	06	96	02	2	155	14	8	6	4	×	×	6	02	51	14	11	148
11	2	426	484	18	8	14	05	97	02	2	160	13	8	6	4	×	×	2	05	53	13	14	147
11	2	427	491	21	8	11	05	97	02	2	157	12	8	6	4	×	×	5	03	53	11	11	132
12	2	428	496	00	8	09	05	94	41	2	158	11	8	6	4	×	×	0	01	51	10	09	112
12	2	429	496	03	8	09	03	98	02	2	155	13	8	6	6	2	×	7	03	02	12	09	118
12	2	429	490	06	8	11	03	98	02	2	143	14	6	6	5	2	×	5	12	52	13	13	148
12	2	429	483	09	8	11	04	98	02	2	137	14	8	×	6	2	×	7	06	01	13	13	132
12	2	428	476	12	8	11	03	96	56	2	133	14	8	6	4	×	×	6	04	02	14	11	136
12	2	428	470	15	8	15	10	96	51	5	120	14	8	6	4	2	×	7	13	02	14	15	134
12	2	428	463	18	8	17	04	97	02	2	107	13	6	6	5	2	×	7	13	05	13	16	106
12	2	428	456	21	9	11	02	91	47	2	093	12	9	×	0	×	×	7	14	03	11	15	105
13	2	428	448	00	8	05	05	93	43	4	087	11	9	×	0	×	×	6	06	02	11	05	102
14	2	424	448	06	9	05	02	93	45	4	108	14	9	×	0	×	×	1	21	02	14	09	131
14	2	421	452	09	8	07	02	98	02	4	114	15	8	1	5	6	×	2	06	00	14	05	152
14	2	421	457	12	8	09	03	97	02	2	127	15	8	6	5	2	×	2	13	54	14	09	169
14	2	422	463	15	7	07	06	97	02	2	127	15	7	6	5	2	×	4	00	00	14	07	148
14	2	423	469	18	7	09	06	97	02	2	127	14	6	6	5	2	×	5	00	52	14	09	152
14	2	424	475	21	7	05	06	97	28	2	139	13	6	6	5	2	×	1	12	52	12	05	140

Table 32. (Continued)

Y′Y′	Q	$L_1L_2L_3$	$L\ L_5L_6$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_1T_1T_1$
15	2	425	481	00	8	08	04	98	03	2	140	14	8	6	4	2	×	1	01	52	12	08	148
15	2	426	488	03	7	09	07	98	02	2	143	13	7	6	5	×	×	1	03	54	12	09	153
15	2	428	494	06	8	09	07	98	02	2	151	12	7	6	5	2	×	2	08	54	11	09	146
15	2	430	500	09	6	07	07	98	02	2	154	13	6	6	5	2	×	2	03	01	11	09	121
15	2	430	505	12	8	08	04	98	02	2	160	11	8	×	6	1	×	2	06	52	10	08	120
15	2	431	511	15	8	05	04	96	02	2	167	11	8	6	5	×	×	0	07	52	11	09	120
15	2	432	517	18	8	05	03	97	02	2	167	11	8	5	5	1	×	7	10	52	11	05	119
15	2	433	524	21	8	09	02	97	02	2	167	12	8	6	5	2	×	3	10	02	10	09	115
16	2	434	529	00	8	09	02	98	02	2	172	12	8	6	5	×	×	2	05	51	11	09	126
16	2	435	537	03	8	09	02	97	02	2	171	13	7	6	5	1	×	6	01	01	11	09	124
16	2	436	543	06	6	09	02	98	01	2	171	13	4	4	6	4	×	4	00	53	10	09	144
16	2	437	549	09	8	09	02	98	03	1	183	12	8	1	5	2	×	2	12	54	09	09	138
16	2	438	555	12	8	11	02	98	02	2	180	12	8	6	4	2	×	6	03	51	09	11	122
16	2	439	561	15	8	11	02	96	02	2	170	10	8	×	×	×	×	7	10	52	09	11	106
16	2	441	567	18	8	00	00	97	02	2	164	10	5	6	4	7	×	7	06	52	09	00	104
16	2	442	574	21	8	09	01	97	02	2	171	10	8	6	5	2	×	2	07	54	10	00	121
17	2	443	580	00	8	15	01	98	02	2	164	11	8	6	5	2	×	7	07	51	09	15	117
17	2	445	587	03	8	15	02	98	02	2	161	14	6	4	4	6	×	7	03	03	11	15	126
17	2	446	594	06	8	00	00	98	02	2	155	10	6	4	4	6	×	7	06	55	09	00	125
17	2	448	600	09	8	11	01	98	02	2	161	10	8	6	5	2	0	3	06	54	08	11	119
17	2	449	606	12	8	10	01	97	02	2	164	10	8	6	5	0	0	2	03	52	07	10	106
17	2	450	612	15	8	10	01	96	02	2	157	09	8	6	5	0	0	7	07	54	08	10	108
17	2	451	618	18	8	36	01	97	02	2	150	09	8	6	4	0	0	7	07	54	09	36	111
17	2	452	628	21	8	36	01	98	02	2	153	09	8	0	6	2	0	0	03	55	09	36	126
18	2	453	631	00	8	34	02	98	02	2	147	11	8	6	5	×	×	6	06	55	10	34	126
18	2	456	639	03	8	34	02	98	02	2	140	12	6	6	5	2	0	7	07	51	11	34	114
18	2	456	645	06	8	34	05	98	02	2	144	12	8	6	5	0	0	3	04	51	11	31	124
18	2	456	652	09	8	31	02	98	02	2	157	11	8	6	5	0	0	3	13	52	10	33	114
18	2	457	658	12	8	33	04	96	50	2	157	11	8	6	5	×	×	4	00	52	11	33	119

Table 32. (Continued)

Y′Y′	Q	LaLaLa	L L.L.	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_xT_x	T_dT_d	d_wd_w	T-T-T_t
18	2	458	664	15	8	31	04	96	15	5	155	12	8	6	4	0	0	7	02	51	11	31	122
18	2	459	671	18	8	31	04	95	41	5	167	11	8	×	5	0	0	2	12	52	11	31	118
18	2	459	677	21	9	31	04	95	43	4	177	12	9	×	0	×	×	2	10	00	11	31	113
19	2	460	680	00	9	34	05	95	41	5	180	12	9	5	0	×	×	3	03	02	12	31	114
19	2	460	682	03	8	34	05	97	02	5	184	11	7	6	4	1	0	3	04	00	12	34	120
19	2	462	688	06	8	34	05	97	02	2	200	10	8	6	5	0	0	2	16	51	10	36	113
19	2	463	694	09	8	36	05	97	02	2	207	10	8	6	5	0	0	2	07	51	10	36	105
19	2	465	700	12	8	36	06	96	02	2	220	11	8	6	5	2	×	2	13	01	09	36	100
19	2	466	704	15	8	34	04	96	02	2	219	10	7	6	4	2	0	7	01	50	10	36	106
19	2	468	710	18	8	36	05	96	02	2	224	10	8	6	4	0	0	3	05	52	10	36	109
19	2	469	715	21	8	36	01	98	02	2	245	10	8	6	4	0	0	3	21	52	10	05	112
20	2	471	721	00	8	05	04	98	02	2	238	10	8	6	5	2	×	7	07	54	09	05	114
20	2	472	728	03	8	05	04	98	02	2	235	10	6	6	5	2	0	0	03	53	10	05	112
20	2	474	733	06	8	04	04	97	02	2	240	10	5	5	5	5	0	3	05	53	09	05	110
20	2	476	739	09	8	36	03	97	02	2	247	11	8	6	5	0	0	2	07	00	10	03	105
20	2	478	744	12	8	36	02	96	02	2	246	10	8	6	5	×	×	6	01	50	10	36	105
20	2	479	748	15	8	36	02	97	02	2	238	10	8	6	5	0	0	7	08	51	10	36	103
20	2	480	750	18	8	34	05	97	02	2	247	09	2	6	5	1	0	2	09	51	09	34	099
20	2	481	750	21	8	34	03	98	02	2	247	09	6	5	5	2	0	4	00	52	09	34	100
21	2	485	750	00	8	01	05	98	02	2	251	09	8	6	5	×	×	1	04	51	08	01	097
21	2	489	749	03	8	32	05	98	02	2	253	08	6	6	5	2	0	2	02	52	08	32	098
21	2	493	750	06	8	34	05	98	02	2	247	08	6	6	5	2	0	7	06	51	08	34	090
21	2	495	750	09	8	27	05	97	02	2	248	08	8	6	5	×	×	2	01	52	07	34	087
21	2	495	750	12	8	31	05	95	28	2	251	07	8	6	5	×	×	2	03	53	07	31	086
21	2	495	750	15	8	34	07	95	02	2	254	07	8	6	5	0	0	2	03	51	07	34	070
21	2	496	750	18	8	34	07	94	41	2	260	07	8	6	5	0	0	2	06	54	06	34	083
21	2	499	750	21	9	31	07	94	41	4	268	09	9	×	0	×	×	2	08	01	09	31	087
22	2	505	750	00	8	29	07	93	41	4	271	10	8	6	6	0	0	2	03	02	09	29	086
22	2	506	750	03	9	29	05	93	45	4	274	09	9	×	0	×	×	2	03	01	09	29	086

Table 32. (Continued)

Y'Y'	Q	$L_aL_aL_a$	LLL	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	dwdw	$T_tT_tT_t$
22	2	509	750	06	9	27	05	93	45	4	274	09	9	×	0	×	×	4	00	01	09	27	081
22	2	512	750	09	9	25	05	93	45	4	271	07	9	×	0	×	×	7	03	51	07	25	074
22	2	512	750	12	8	27	06	96	02	2	268	07	8	6	5	×	×	7	03	50	07	27	076
22	2	512	750	15	8	27	05	97	02	2	266	07	8	6	5	0	0	7	02	00	07	27	070
22	2	513	750	18	8	27	07	96	02	2	264	08	8	6	5	0	0	7	02	50	08	27	084
22	2	516	750	21	8	27	07	96	02	2	263	09	8	6	5	0	0	7	01	02	08	28	080
23	2	520	750	00	8	27	07	96	02	2	257	09	4	6	5	4	0	7	06	02	09	27	084
23	2	525	751	03	9	25	07	94	41	2	253	10	9	×	0	×	×	7	04	03	09	23	084
23	2	529	750	06	6	25	05	95	40	4	241	09	1	6	5	2	0	7	12	02	09	25	078
23	2	530	750	09	9	22	05	92	44	4	235	07	9	×	0	×	×	7	06	52	06	22	075
23	2	530	750	12	8	21	06	94	44	4	223	07	4	6	5	2	×	7	12	52	06	21	076
23	2	530	750	15	8	21	06	95	28	4	204	06	5	6	4	1	0	7	19	51	06	21	068
23	2	531	750	18	8	16	06	96	40	4	193	06	8	6	5	0	0	7	11	52	06	16	072
23	2	535	750	21	9	16	07	96	41	4	195	07	9	×	0	×	×	2	02	52	06	16	075
24	2	538	750	00	8	16	08	95	44	4	183	07	8	0	6	2	×	7	12	52	06	16	076
24	2	543	751	03	9	15	07	94	41	4	176	07	9	×	0	×	×	8	07	52	07	15	080
24	2	547	750	06	8	11	07	95	02	4	164	07	5	6	5	2	0	7	12	52	07	11	079
24	2	550	750	09	8	16	08	98	01	4	147	07	8	6	6	2	2	7	23	51	07	16	077
24	2	550	750	12	8	12	06	96	50	2	147	07	8	6	5	×	×	0	06	51	07	13	074
24	2	550	750	15	8	12	03	96	02	2	137	07	8	6	5	×	×	7	10	51	07	12	078
24	2	550	753	18	8	11	06	97	02	2	128	08	8	6	5	0	0	7	09	00	08	11	078
24	2	550	760	21	9	11	08	93	46	2	127	08	9	×	0	×	×	7	01	51	07	11	084
25	2	550	760	00	8	08	08	95	42	4	124	08	8	0	6	2	×	7	03	00	08	08	083
25	2	550	772	03	0	04	07	93	44	4	114	08	0	0	9	0	0	6	10	52	08	04	092
25	2	550	779	06	9	03	07	93	45	4	113	09	9	×	0	×	×	8	01	02	09	03	088
25	2	550	787	09	9	03	05	93	45	4	111	09	9	×	0	×	×	7	02	01	08	05	084
25	2	550	793	12	3	33	02	95	42	4	103	07	2	6	6	2	0	7	08	51	07	33	074
25	2	550	799	15	9	25	02	93	44	4	180	07	9	×	0	×	×	7	03	51	07	25	080
25	1	550	793	18	9	25	05	93	44	4	107	07	9	×	0	×	×	3	07	52	07	25	081

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
25	1	550	785	21	9	20	07	94	44	4	104	07	9	×	0	×	×	7	03	53	07	20	087
26	1	548	784	00	8	20	12	94	42	4	093	07	8	0	6	2	×	7	11	53	07	20	085
26	1	544	784	03	9	18	12	93	44	4	071	08	9	×	0	×	×	7	22	00	08	18	082
26	1	542	784	06	9	18	13	93	44	4	039	10	9	×	0	×	4	7	32	02	09	18	089
26	1	542	784	09	9	18	17	93	53	4	028	10	9	×	0	×	4	6	11	03	09	18	082
26	1	541	785	12	8	18	18	94	02	5	028	09	8	×	6	2	4	5	00	04	09	18	072
26	1	540	785	15	9	20	20	96	02	2	035	09	9	×	0	×	4	2	07	01	09	20	082
26	1	538	785	18	9	22	20	94	40	2	054	08	9	×	0	×	4	2	19	00	09	22	084
26	1	537	785	21	8	22	20	96	01	4	080	08	8	6	4	0	4	2	26	00	08	22	083
27	1	535	789	00	8	22	10	94	46	2	101	08	8	0	6	2	6	2	21	00	08	22	084
27	1	536	793	03	9	21	09	94	47	4	126	08	9	×	0	×	6	2	25	00	08	21	080
27	1	537	798	06	9	29	05	93	47	4	140	08	9	×	0	×	6	2	14	51	08	29	083
27	2	537	795	09	9	00	00	93	44	4	154	06	9	×	0	×	6	2	14	53	07	00	082
27	2	537	789	12	8	09	01	95	02	4	148	07	8	0	6	2	6	7	06	52	07	09	079
27	2	537	784	15	9	07	01	93	44	1	147	07	0	0	0	0	6	5	01	52	07	07	078
27	2	537	777	18	9	05	04	93	47	4	160	06	9	×	0	×	6	2	13	53	06	05	079
27	2	535	775	21	9	04	04	92	44	4	180	07	9	×	0	×	4	2	20	51	07	04	081
28	2	531	775	00	9	05	04	93	45	4	184	09	9	×	0	×	4	2	04	01	09	05	090
28	2	526	775	03	8	05	04	97	40	4	190	10	8	6	4	0	4	3	06	02	10	05	088
28	2	523	775	06	8	05	04	96	40	2	184	08	8	6	5	0	4	7	06	00	08	05	082
28	2	523	781	09	8	05	04	96	43	4	187	08	9	×	0	×	2	1	03	00	08	05	082
28	2	523	788	12	8	09	03	95	28	4	187	08	8	6	5	×	2	4	00	00	08	09	083
28	2	523	793	15	8	18	03	95	41	2	203	08	8	6	5	0	2	2	16	50	08	18	083
28	2	523	799	18	8	22	04	96	02	2	221	07	8	6	5	0	2	2	18	02	07	22	064
28	2	522	799	21	9	20	03	93	44	2	233	06	9	×	0	×	4	2	12	00	06	20	062
29	2	519	800	00	9	18	04	93	45	4	240	07	9	×	0	×	4	2	07	02	07	18	061
29	1	515	800	03	8	18	07	95	60	4	248	08	8	6	3	×	4	2	08	02	08	18	069
29	1	511	799	06	9	18	07	93	47	6	239	09	9	×	0	×	×	8	09	03	09	18	072
29	1	510	799	09	8	20	07	97	02	4	234	10	8	6	4	×	×	7	05	06	10	20	072

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
29	1	514	797	12	9	22	05	93	45	4	240	08	9	×	0	×	×	2	06	03	08	22	066
29	1	518	796	15	8	20	04	95	28	4	247	08	8	6	4	0	0	2	07	03	08	20	066
29	1	521	791	18	8	18	07	94	40	2	246	08	8	6	5	0	0	7	01	03	08	18	067
29	1	522	785	21	9	18	07	94	43	4	247	08	9	×	0	×	×	2	01	00	08	18	083
30	1	525	784	00	8	23	11	95	53	4	250	09	8	0	6	2	×	2	03	03	09	20	078
30	1	528	780	03	9	20	11	93	61	5	239	08	9	×	0	×	×	7	11	02	08	20	073
30	1	531	774	06	8	18	11	96	21	6	229	09	8	6	5	0	0	7	10	01	09	18	089
30	1	533	771	09	8	17	08	96	61	5	216	09	8	7	3	0	0	8	13	00	09	17	082
30	1	533	771	12	8	17	12	95	63	5	210	10	8	6	3	0	0	7	06	02	10	17	080
30	1	533	771	15	8	20	12	94	62	5	200	10	8	6	5	×	×	7	10	01	09	20	092
30	1	535	767	18	8	17	11	94	21	6	200	10	8	6	5	0	0	4	00	01	09	17	089
30	1	537	763	21	8	20	07	97	61	5	190	09	8	6	4	0	0	7	10	00	09	23	091
31	1	540	763	00	8	23	08	97	02	6	191	10	8	6	5	×	×	2	01	40	10	23	095
31	1	544	762	03	8	02	05	96	02	2	200	09	8	6	5	0	0	1	09	51	08	02	095
31	1	550	763	06	8	05	08	97	02	2	214	08	8	6	5	0	0	2	14	51	08	05	089
31	1	550	763	09	8	07	04	97	02	2	227	07	5	6	4	1	0	1	13	53	07	07	087
31	1	550	763	12	8	04	04	97	02	2	237	07	8	6	5	0	0	2	10	53	07	04	087
31	1	552	765	18	8	04	02	98	02	2	248	07	8	6	5	0	0	2	14	54	06	04	086
31	1	556	767	21	8	00	00	98	02	2	259	07	8	6	5	0	0	2	11	53	06	00	089
08 01	1	561	770	00	8	31	03	98	02	2	254	08	8	6	5	×	×	5	05	52	08	31	093
01	1	565	772	03	8	28	06	97	02	2	256	09	8	6	5	0	0	3	02	00	07	28	091
01	1	566	773	06	8	27	06	98	02	2	253	08	8	6	5	0	0	5	03	52	08	27	092
01	1	568	774	09	8	27	05	98	02	2	264	09	8	6	5	0	0	1	11	00	06	27	085
01	1	568	774	12	8	25	05	98	02	2	261	08	8	6	5	0	0	7	03	52	07	25	087
01	1	568	773	15	8	25	06	97	02	2	260	07	8	6	5	×	×	5	01	54	05	25	086
01	1	570	774	18	8	25	07	98	02	2	261	08	8	6	5	0	0	2	01	51	06	25	083
01	1	576	775	21	8	23	07	98	02	2	253	09	8	6	5	0	0	7	08	00	08	23	086
02	1	579	780	00	8	25	08	98	02	2	241	09	8	6	5	×	×	7	12	51	08	25	091
02	1	582	783	03	8	25	08	98	02	2	219	09	8	6	5	0	0	6	22	00	08	25	083

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
02	1	582	782	06	8	21	11	97	02	2	201	09	8	6	5	0	0	7	18	00	09	21	085
02	1	587	785	09	9	47	11	93	47	2	198	09	9	×	0	×	×	7	03	50	08	21	087
02	1	590	787	12	8	22	10	95	02	4	173	09	8	6	5	2	×	7	25	00	09	22	090
02	1	594	789	15	8	22	10	94	43	2	145	09	8	6	×	0	0	7	28	01	09	22	085
02	1	598	793	18	8	22	07	94	46	2	115	09	8	6	5	0	0	7	30	01	09	22	087
02	1	601	794	21	8	21	06	95	61	4	095	10	8	6	4	0	0	7	20	03	10	21	086
03	1	605	797	00	8	27	05	97	02	2	093	10	8	6	5	2	0	5	02	03	10	27	090
03	1	608	799	03	6	27	03	94	51	2	092	09	4	6	4	8	1	5	01	51	09	25	097
03	1	612	798	06	8	25	03	97	02	2	084	10	8	6	5	0	0	7	08	03	10	25	088
03	2	614	797	09	9	23	02	93	45	4	075	09	9	×	0	×	×	7	09	00	08	23	085
03	2	614	797	12	9	21	03	94	45	4	075	09	9	×	0	×	×	5	00	01	09	21	084
03	2	614	797	15	9	20	04	94	45	4	075	07	9	×	0	×	×	5	00	51	07	20	085
03	2	619	799	18	0	23	04	94	42	4	074	08	0	0	9	0	0	5	01	51	07	23	083
04	1	617	785	00	8	27	07	93	44	4	090	13	8	0	6	2	×	2	16	03	11	27	094
04	1	618	786	03	0	21	10	94	44	4	993	09	0	0	9	0	0	3	03	52	08	21	097
04	1	619	780	06	0	21	10	94	44	4	104	08	0	0	9	0	0	2	11	51	08	21	087
04	1	620	771	09	9	21	06	96	45	4	108	08	9	×	0	×	×	2	04	50	08	21	082
4	1	622	765	12	4	23	04	94	44	4	111	08	4	0	6	2	0	2	03	50	07	23	078
4	1	624	756	15	0	23	04	93	44	4	114	07	0	0	9	0	0	2	03	52	07	23	083
4	1	625	749	18	0	23	07	93	44	4	114	09	0	0	9	0	0	0	00	01	09	23	087
5	1	628	740	00	9	20	07	93	45	4	112	09	9	×	0	×	×	5	02	01	08	18	082
5	1	630	731	03	8	20	10	96	51	5	114	09	8	6	4	0	0	2	02	00	08	20	085
5	1	631	729	06	8	20	10	96	51	5	079	09	8	6	4	0	0	6	35	00	08	20	085
5	1	630	723	09	8	20	10	96	51	5	074	09	8	6	5	0	0	6	05	01	08	20	084
5	1	628	715	12	8	20	13	95	61	5	060	10	8	0	0	2	×	7	14	02	09	20	090
5	1	625	710	15	8	19	13	96	50	5	050	09	8	6	4	0	0	7	10	00	09	19	090
5	1	623	702	18	8	23	14	96	02	5	046	09	8	6	5	0	0	6	04	01	08	23	085
5	1	622	695	21	8	23	14	96	02	2	043	09	8	6	5	×	×	7	03	01	08	23	085
6	1	619	693	00	8	23	13	95	61	2	041	09	8	6	5	2	×	6	02	00	08	23	085

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
6	1	615	690	03	8	23	14	95	61	6	041	09	8	6	4	0	0	5	00	01	08	23	081
6	1	615	690	06	8	23	14	95	61	6	041	08	8	6	5	0	0	5	00	00	08	23	081
6	1	615	686	09	8	23	11	94	44	5	057	08	8	6	5	0	0	2	16	01	08	23	075
6	1	613	685	12	8	26	11	94	02	4	078	08	8	6	5	2	×	2	21	02	08	26	071
6	1	608	688	15	8	29	10	94	41	4	093	07	8	6	4	0	0	2	15	01	07	29	066
6	1	604	689	18	0	29	05	96	40	1	110	07	0	0	9	0	0	2	17	01	07	29	063
6	1	603	690	21	8	25	02	97	02	4	115	09	8	0	6	2	0	2	05	03	09	25	074
7	1	606	686	00	8	27	01	94	46	2	127	08	8	0	6	2	0	2	12	00	08	27	083
7	1	609	685	03	8	27	01	96	02	2	128	10	7	6	4	1	0	2	01	01	10	27	093
7	1	611	684	06	8	05	02	96	02	2	127	08	7	6	4	1	0	5	01	00	08	05	083
7	1	612	684	09	7	05	02	97	02	2	130	08	7	6	5	0	0	2	03	00	08	05	080
7	1	609	686	12	9	32	01	94	47	2	133	08	9	×	0	×	×	2	03	01	07	32	074
7	1	605	688	15	9	00	00	92	47	4	140	08	9	×	0	×	×	2	07	00	07	00	074
7	1	601	690	18	8	00	00	94	42	4	147	08	8	6	5	0	0	2	07	01	07	00	073
7	1	597	693	21	9	00	00	94	45	4	160	09	9	×	0	×	×	2	13	01	09	00	086
8	1	595	692	00	7	34	02	91	41	4	163	09	7	6	5	×	×	2	03	50	09	34	090
8	1	594	696	03	2	32	02	98	01	1	168	10	1	5	5	4	0	3	05	01	10	32	089
8	1	594	693	06	9	36	01	93	47	0	177	10	9	×	0	×	×	1	03	02	09	36	088
8	1	591	695	12	3	31	02	95	46	0	195	07	3	5	6	2	0	2	12	51	07	00	078
8	1	588	701	15	8	00	00	93	44	4	200	09	8	6	4	0	0	2	05	00	08	00	083
8	1	585	706	18	8	02	05	98	02	4	212	08	5	6	4	2	0	2	12	51	08	25	087
8	1	585	705	21	9	20	03	93	42	2	214	08	9	×	0	×	×	1	02	52	08	20	092
9	1	587	704	03	6	18	06	95	40	2	221	08	4	5	4	1	0	0	02	52	08	18	092
9	1	587	703	06	9	15	11	95	47	4	217	08	9	×	0	×	×	7	04	00	08	15	082
9	1	586	703	09	8	18	14	96	03	4	211	08	8	6	6	2	×	7	06	00	08	18	080
9	1	583	707	12	8	18	16	96	62	2	220	09	8	6	5	×	×	3	09	01	09	18	081
9	1	582	708	15	9	18	19	95	45	6	226	09	9	×	0	×	×	2	06	02	09	18	079
9	1	581	708	18	9	16	15	94	45	4	234	09	9	×	0	×	×	2	08	02	09	18	078
10	1	583	670	00	9	19	15	93	45	4	253	09	9	×	0	×	×	2	19	01	09	19	084

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
10	1	584	697	03	9	20	15	95	45	4	267	09	9	×	0	×	×	1	14	00	09	20	091
10	1	585	696	06	9	20	15	94	45	4	270	09	9	×	0	×	×	2	03	00	08	20	085
10	1	585	694	09	9	20	11	94	45	4	281	09	9	×	0	×	×	2	11	02	09	20	080
10	1	583	700	12	8	20	17	94	02	4	288	09	8	6	5	×	×	2	07	02	09	20	082
10	1	581	705	15	8	18	15	94	02	2	294	10	8	6	5	0	0	2	06	03	10	18	081
10	1	579	711	18	9	18	15	93	45	2	293	10	9	×	0	×	×	5	01	06	10	18	074
10	1	577	715	21	8	20	16	96	02	4	306	11	8	6	5	×	×	2	13	03	11	20	090
11	1	575	720	00	8	20	14	96	02	2	317	11	8	6	5	×	×	2	11	02	10	20	094
11	1	575	719	03	8	20	09	95	41	2	314	10	8	6	5	×	×	7	03	02	10	20	091
11	1	575	717	06	6	22	14	94	45	4	201	10	4	6	5	1	0	7	13	02	10	22	091
11	1	573	716	09	9	20	10	94	45	4	306	09	9	×	0	×	×	3	05	00	09	20	092
11	1	570	718	12	9	20	15	91	47	4	308	10	9	×	0	×	×	2	02	01	10	20	098
11	1	566	719	15	8	20	05	97	41	4	306	11	8	6	4	×	×	7	02	02	11	20	096
11	1	563	720	18	7	18	05	96	45	4	299	11	7	6	5	0	0	7	07	03	10	18	097
11	1	560	720	21	8	16	08	97	02	4	294	11	7	6	6	2	×	7	05	50	11	16	110
12	1	553	721	00	9	16	05	91	46	2	288	10	9	×	0	×	×	7	06	53	10	16	114
12	1	554	720	03	9	11	02	93	44	4	274	11	9	×	0	×	×	6	14	52	10	11	116
12	1	550	720	06	9	15	04	93	45	4	256	09	9	×	0	×	×	7	18	53	09	15	118
12	1	546	720	09	8	00	00	97	02	4	250	10	7	6	5	×	×	7	06	52	10	00	109
12	1	542	720	12	9	34	02	91	47	2	235	10	9	×	0	×	×	8	15	51	10	34	108
12	1	540	720	15	7	34	02	97	02	4	215	10	7	6	5	×	×	7	20	52	10	34	111
12	1	536	721	18	8	36	01	95	40	4	211	11	8	6	4	0	0	6	04	51	11	36	109
12	1	531	720	21	9	29	05	93	43	4	211	10	9	×	0	×	×	4	00	52	10	29	113
13	1	530	720	00	7	29	04	97	01	4	199	12	7	4	5	0	0	7	12	01	12	29	114
13	1	524	720	03	9	29	04	91	47	2	194	10	9	×	0	×	×	7	05	05	10	29	074
13	1	522	720	06	9	29	01	93	45	4	197	08	9	×	0	×	×	3	03	04	07	29	059
13	1	528	720	09	7	25	07	98	02	4	197	10	7	6	6	2	×	4	00	01	13	25	099
13	1	516	720	12	8	22	08	94	66	2	183	11	8	6	5	×	×	7	16	01	11	22	103
13	1	512	720	15	8	22	11	95	61	6	168	12	8	6	4	0	0	7	15	03	12	22	106

Table 32. (Continued)

Y′Y′	Q	$L_aL_dL_a$	$L_nL_nL_n$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_rT_rT_r$
13	1	509	720	18	8	22	11	96	58	6	159	13	8	6	4	0	0	7	09	01	13	22	120
13	1	506	719	21	9	22	16	93	60	6	154	13	9	×	0	×	×	6	05	01	13	22	120
14	1	502	719	00	9	22	18	93	02	6	148	13	9	×	0	×	×	7	06	01	13	22	122
14	1	498	720	03	8	25	17	97	02	2	146	13	8	7	3	0	0	7	02	01	12	25	122
14	1	495	720	06	8	27	18	96	02	2	154	12	8	6	4	0	0	3	08	00	12	25	120
14	1	490	720	09	8	25	19	95	02	2	165	13	8	6	4	0	0	3	11	01	13	25	124
14	1	486	720	12	9	25	19	92	43	2	170	13	9	×	0	×	×	3	05	01	13	25	128
14	1	482	720	15	8	27	21	96	02	2	171	14	8	7	4	0	0	3	01	01	14	27	135
14	1	482	720	18	8	27	21	96	02	2	173	14	4	7	5	1	0	2	02	01	14	27	133
14	1	481	725	21	8	27	21	95	02	2	187	14	8	6	5	×	×	2	14	01	13	27	129
15	1	480	729	00	8	27	15	96	02	2	194	14	8	6	5	×	×	2	07	01	14	27	135
15	1	480	735	03	8	31	11	97	02	2	199	12	6	6	5	0	0	2	05	52	12	31	135
15	1	479	742	06	8	31	11	97	02	2	200	12	6	6	5	2	0	2	01	52	12	31	134
15	1	479	747	09	8	31	15	96	02	2	212	12	8	6	5	×	×	2	12	52	12	31	135
15	1	477	753	12	8	31	17	96	02	2	220	13	8	×	×	×	×	2	08	51	13	31	138
15	1	476	759	15	8	33	10	96	02	2	226	12	5	4	4	2	×	2	06	52	12	31	138
15	1	477	764	18	8	33	10	98	02	2	239	13	5	4	4	2	0	2	13	51	13	33	140
15	1	476	769	21	8	33	06	98	02	2	244	14	8	6	6	×	×	2	05	52	13	33	147
16	1	475	775	00	7	33	05	98	01	2	246	14	7	5	6	0	0	2	02	54	13	33	159
16	1	474	782	03	7	00	00	98	02	2	238	15	5	8	5	2	0	8	08	54	14	00	168
16	1	473	789	06	8	25	02	98	02	2	239	16	5	8	5	2	0	2	01	51	15	25	161
16	1	472	796	09	8	27	01	96	02	2	241	16	8	6	6	×	×	2	02	51	16	27	169
16	1	471	800	12	1	16	07	98	01	2	233	16	1	5	6	×	×	7	08	51	16	16	168
16	2	470	786	15	1	14	05	98	02	0	218	17	1	4	5	×	×	8	15	51	17	14	175
16	2	468	787	18	5	13	06	98	03	1	194	18	2	4	5	3	0	7	24	01	18	13	176
16	2	467	780	21	8	11	08	96	51	2	168	18	8	6	5	0	0	7	26	01	18	11	180
17	2	467	774	00	9	23	10	92	43	5	163	19	9	×	0	×	×	7	05	01	19	23	190
17	2	465	768	03	4	23	10	98	01	1	143	21	1	7	2	6	×	7	20	04	21	23	190
17	2	464	762	06	6	23	17	97	25	1	126	21	3	4	5	2	0	6	17	01	20	23	202

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
17	2	462	757	09	8	23	15	97	03	1	140	20	8	6	6	×	×	3	14	01	20	23	194
17	2	462	755	12	8	23	11	94	42	2	137	20	9	6	5	×	×	8	03	01	20	23	191
17	2	460	750	15	9	23	10	94	25	4	126	20	9	×	0	×	×	8	11	02	19	23	185
17	2	459	744	18	8	23	13	97	22	6	123	20	8	6	4	0	0	5	03	02	19	23	189
17	2	457	739	21	8	23	10	97	40	2	131	19	8	6	4	0	0	1	08	51	19	23	197
18	2	455	733	00	8	23	08	97	01	2	120	20	8	6	5	×	×	7	11	01	20	23	195
18	2	454	727	03	8	23	08	94	51	5	114	20	2	6	3	2	×	7	06	01	20	23	196
18	2	452	721	06	8	23	08	96	20	6	107	20	6	6	4	2	0	8	07	51	20	23	205
18	2	451	716	09	8	25	09	96	03	2	111	19	8	6	6	0	0	3	04	52	19	25	201
18	2	449	710	12	8	27	17	96	02	2	107	18	8	6	5	×	×	7	04	54	18	27	201
18	2	447	705	15	6	27	18	96	02	2	101	18	5	6	5	1	0	7	06	54	17	27	193
18	2	447	699	18	8	27	18	97	02	2	100	18	5	6	5	6	0	6	01	52	17	27	194
18	2	445	697	21	8	27	19	97	02	2	114	18	5	6	5	6	0	3	14	53	17	27	194
19	2	444	695	00	7	31	17	97	02	2	127	18	7	4	5	0	0	2	13	52	16	31	191
19	2	444	693	03	6	31	18	98	02	1	140	17	5	2	4	6	1	3	13	54	16	31	185
19	2	442	687	06	7	31	16	98	02	1	160	17	4	2	5	6	1	2	20	54	14	31	182
19	2	441	683	09	7	33	10	98	02	1	180	16	7	6	7	5	0	2	20	53	13	31	176
19	2	439	677	12	7	33	05	96	02	2	195	17	7	4	5	0	0	2	15	52	14	33	176
19	2	437	761	15	6	33	05	96	02	2	199	16	5	4	5	5	0	2	04	52	14	33	173
19	2	436	666	18	7	16	01	98	02	2	201	17	5	4	5	5	0	2	02	51	16	16	173
19	2	434	659	21	3	16	04	98	01	2	197	19	4	0	7	5	0	5	04	00	18	16	186
20	2	432	652	00	2	22	08	98	01	1	204	20	3	4	5	5	0	2	07	01	23	22	196
20	2	431	646	03	4	22	06	98	01	0	200	21	2	1	5	6	1	7	04	01	20	22	210
20	2	430	640	06	2	25	08	98	02	0	199	21	2	8	5	3	0	5	01	01	20	25	205
20	2	430	633	09	6	22	08	98	02	0	198	21	2	0	7	1	1	7	01	03	23	22	192
20	2	430	627	12	9	20	06	98	02	0	198	19	6	0	6	1	2	4	00	01	19	20	190
20	2	430	621	15	9	22	07	93	46	1	195	19	9	×	0	×	×	7	03	00	20	22	192
20	2	430	615	18	9	22	06	97	02	4	186	20	9	×	0	×	×	7	09	02	20	22	192
20	2	430	608	21	7	25	07	94	45	2	187	20	9	×	0	×	×	1	01	01	20	25	194

Table 32. (Continued)

Y′Y′	Q	$L_aL_aL_a$	$L_oL_oL_o$	GG	N	dd	ff	VV	ww	W	PPP	TT	N_h	C_L	h	C_M	C_H	a	PP	T_sT_s	T_dT_d	d_wd_w	$T_tT_tT_t$
21	2	430	602	00	4	22	08	97	03	4	180	21	7	7	5	2	0	7	07	01	25	22	203
21	2	430	596	03	8	22	07	98	01	1	164	22	4	4	5	3	1	7	16	02	21	22	208
21	2	430	600	06	3	21	08	98	02	1	144	21	4	4	5	3	1	7	20	02	21	22	207
21	2	431	583	09	8	21	08	98	01	1	131	22	3	0	7	2	1	7	13	03	21	21	204
21	2	431	577	12	8	18	10	96	03	0	114	—	8	6	5	×	×	7	17	—	—	18	202
21	2	431	571	15	8	20	11	96	03	5	079	22	8	6	5	×	×	7	35	04	21	20	198
21	2	431	566	18	8	31	13	96	02	2	093	—	8	6	4	×	×	2	14	—	—	31	198
21	2	431	560	21	8	31	12	98	02	2	114	16	8	6	5	0	0	2	21	56	—	31	190
22	2	431	554	00	8	31	14	96	02	2	120	—	8	6	5	×	×	2	06	—	—	31	188
22	2	431	547	03	8	29	10	97	02	2	131	—	8	6	5	×	×	2	11	—	—	29	172
22	2	431	541	06	8	29	06	97	02	2	121	16	6	6	5	2	×	7	10	52	15	29	172
22	2	431	535	09	8	29	06	98	02	2	126	16	8	6	6	0	0	3	05	53	15	29	169
22	2	431	529	12	8	31	05	97	02	2	125	15	8	6	5	×	×	5	01	53	15	31	168
22	2	431	522	15	8	02	04	97	02	2	120	15	6	6	4	2	×	7	05	54	14	02	168
22	2	431	516	18	8	02	04	97	02	2	107	15	6	6	4	2	0	7	13	00	14	02	150
22	2	431	509	21	7	02	04	98	02	2	110	15	5	6	5	2	0	0	03	54	14	02	167
23	2	431	502	00	8	05	16	97	02	2	100	15	8	6	5	×	×	7	10	54	14	05	170
23	2	433	497	03	8	05	16	97	02	2	093	15	8	6	5	×	×	7	07	54	14	05	171
23	2	432	491	06	7	05	11	97	02	2	097	15	6	5	4	2	×	3	04	52	—	05	163
23	2	431	484	09	8	05	10	97	02	2	090	15	5	5	5	2	0	5	07	54	—	05	166
23	2	429	478	12	8	36	03	96	02	2	100	14	8	6	5	×	×	3	10	53	—	36	156
23	2	428	472	15	8	36	03	95	02	2	100	14	8	6	5	×	×	4	00	53	—	36	166
23	2	427	466	18	8	36	04	96	02	2	090	14	6	6	4	2	×	8	10	57	—	36	172
23	2	425	460	21	8	36	07	97	02	2	099	14	6	6	4	2	0	3	09	59	—	36	181
24	2	424	453	00	8	36	13	97	02	2	107	15	8	6	6	×	×	2	08	57	—	36	184
24	2			03	8	03	06	97	02	2	113	16	8					2	06	55	—	03	189

7. Data on Temperature and Salinity, and Computed Data on Dynamic Depth

(温度塩分記録及ダイナミックデプス計算値)

Glass bottles were used for storing the sample of sea water because the polyethylene bottles used in the previous cruise seemed to be inadequate.

Double titration for chlorinity determination, calculation of depths, interpolation of data, and computation of dynamic depth were made by H. Koto.

Code of the World Meteorological Organization

- dd: Wind direction
- ff: Wind speed
- ww: Present weather
- TTT: Air temperature
- dwdw: Direction of movement of wave "from"
- Pw: Period of wave (no observation)
- Hw: Height of wave (no observation)
- dsds: Direction of swell "from"
- Ps: Period of swell (no observation)
- Hs: Height of swell (no observation)

Abbreviations

- F: Determination of position
  - by dead reckoning more than 24 hours after the sun sight (1)
  - by sun sight within 24 hours (2)
  - by means of Loran (3)
  - by means of Radar (4)
  - by bearing on shore (5)
- Tr: Transparency of water in metres as represented by Secchi's disc reading
- D: Depth of sea bottom in metres
  - assumed from a hydrographic chart (1)
  - determined by sounding by lead (2)
  - determined by echo-sounding (3)
- ×: No observation

Table 33. Data on temperature, Salinity and dynamic depth in 1956 cruise to the Bering Sea

Station Os 1

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1600–2000	20	7	1956	47°56′N	174°51′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
34	05	02	095	34	16	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		10.2	18.05	32.61
9	25	9.53	18.05	32.61
22	〃	7.41	18.16	32.81
45	〃	5.26	18.28	33.03
70	〃	4.76	18.28	33.03
90	〃	4.27	18.29	33.04
139	〃	3.48	18.60	33.60
163	35	3.30	18.68	33.75
236	〃	3.41	18.80	33.96
346	30	3.44	18.86	34.07
420	〃		18.90	34.14
497	〃	3.37	18.95	34.23
670	〃	3.02	18.97	34.27
851	〃	2.74	19.03	34.38
1040	〃	2.67	19.05	34.42
1335	〃	2.32	19.09	34.49

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	10.2	18.05	32.61	25.08	289	
10	10.45	18.05	32.61	25.03	294	0.029
25	7.00	18.17	32.83	25.73	228	0.068
50	5.10	18.28	33.03	26.12	191	0.120
75	4.61	18.28	33.03	26.18	185	0.167
100	4.06	18.34	33.13	26.31	172	0.212
150	3.48	18.64	33.68	26.80	126	0.287
200	3.31	18.76	33.89	27.00	107	0.346
300	3.43	18.84	34.04	27.10	98	0.450
400	3.42	18.89	34.13	27.17	91	0.547
500	3.35	18.95	34.23	27.26	82	0.627
600	3.15	18.96	34.25	27.30	79	0.711
800	2.80	19.01	34.34	27.40	69	0.865
1000	2.69	19.05	34.42	27.46	63	1.011
1200	2.50	19.07	34.45	27.51	59	1.116

Station Os 2

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0757–0900	21	7	1956	49°30′N	175°00′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	05	02	079	34	16	3	11

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.7	18.08	32.66
10	12	8.46	18.14	32.77
24	〃	7.07	18.16	32.81
49	〃	4.79	18.26	32.99
73	〃	3.68	18.28	33.03
90	26	3.62	18.36	33.17
135	〃	3.61	18.68	33.75
180	〃	3.59	18.78	33.93
205	47	3.58	18.79	33.95
259	〃	3.70	18.87	34.09
327	〃	3.51	18.90	34.14
395	〃	3.45	18.91	34.16
534	〃	3.30	18.98	34.29
688	〃	3.05	19.02	34.36
842	〃	2.81	19.03	34.38
1100	〃	2.46	19.07	34.45

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.7	18.08	32.66	25.36	263	
10	8.46	18.14	32.77	25.48	251	0.026
25	7.00	18.16	32.81	25.72	229	0.062
50	4.72	18.26	32.99	26.13	190	0.114
75	3.66	18.28	33.03	26.27	176	0.160
100	3.62	18.46	33.35	26.53	152	0.201
150	3.60	18.71	33.80	26.90	117	0.268
200	3.58	18.79	33.95	27.01	106	0.324
300	3.59	18.90	34.14	27.17	91	0.424
400	3.44	18.91	34.16	27.20	88	0.516
500	3.33	18.96	34.25	27.28	80	0.604
600	3.19	19.00	34.33	27.35	74	0.685
800	2.89	19.03	34.38	27.42	67	0.855
1000	2.60	19.05	34.42	27.48	62	0.995
1200	2.35	19.09	34.49	27.56	54	1.122

Table 33. (Continued)

Station Os 3

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0024–0137	22	7	1956	50°19′N	175°00′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
29	07	41	082	29	31	2	17

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.2	18.06	32.63
10	7	7.23	18.08	32.66
25	〃	6.16	18.24	32.95
50	〃	4.35	18.34	33.13
75	8	3.72	18.38	33.21
99	〃	3.56	18.44	33.31
149	〃	4.01	18.58	33.57
198	〃	4.07	18.67	33.73
248	32	4.00	18.75	33.87
330	〃	3.89	18.82	34.00
412	〃	3.71	18.84	34.01
495	〃	3.66	18.92	34.18
660	〃	3.46	18.96	34.25
828	〃	3.13	19.01	34.34
1000	〃	2.93	19.04	34.40
1280	〃	2.44	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.2	18.06	32.63
10	7.23	18.08	32.66
25	6.16	18.24	32.95
50	4.35	18.34	33.13
75	3.72	18.38	33.21
100	3.56	18.44	33.31
150	4.02	18.58	33.57
200	4.07	18.67	33.73
300	3.92	18.80	33.96
400	3.75	18.84	34.04
500	3.66	18.93	34.20
600	3.55	18.96	34.25
800	3.20	19.00	34.33
1000	2.93	19.04	34.40
1200	2.59	19.08	34.47

Computed

σ_t	$10^5\triangle$ st	$\triangle$ D
25.40	259	
25.57	243	0.025
25.94	208	0.059
26.29	174	0.107
26.41	163	0.149
26.51	154	0.189
26.66	139	0.262
26.93	114	0.326
26.99	108	0.439
27.06	101	0.547
27.20	88	0.645
27.26	82	0.735
27.35	74	0.902
27.43	66	1.054
27.52	58	1.191

Station Os 4

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1907–2000	22	7	1956	51°30′N	175°00′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	07	02	085	27	29	2	16

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.3	18.03	32.57
10	9	8.17	18.18	32.84
25	〃	7.13	18.21	32.90
49	〃	5.03	18.28	33.03
74	12	4.20	18.30	33.06
98	〃	3.84	18.30	33.06
147	〃	4.09	18.47	33.37
196	〃	3.97	18.56	33.53
272	26	4.06	18.67	33.73
365	〃	3.98	18.78	33.93
460	〃	3.80	18.84	34.04
551	〃	3.39	18.87	34.09
740	〃	3.31	18.93	34.20
930	〃	3.13	19.01	34.34
1126	〃	2.75	19.03	34.38
1425	〃	2.40	19.08	34.47

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.3	18.03	32.57
10	8.17	18.18	32.84
25	7.13	18.21	32.90
50	5.00	18.28	33.03
75	4.16	18.30	33.06
100	3.83	18.30	33.06
150	4.10	18.48	33.39
200	3.97	18.57	33.55
300	4.06	18.70	33.78
400	3.89	18.81	33.98
500	3.63	18.85	34.05
600	3.33	18.88	34.11
800	3.30	18.96	34.25
1000	3.02	19.02	34.36
1200	2.62	19.04	34.40
1500	(2.34	(19.09)	34.49)

Computed

σ_t	$10^5\triangle$st	$\triangle$ D
25.35	264	
25.58	242	0.025
25.77	224	0.060
26.13	190	0.112
26.25	178	0.158
26.29	174	0.202
26.52	153	0.284
26.66	139	0.358
26.83	123	0.491
27.00	107	0.609
27.10	98	0.715
27.17	91	0.813
27.28	80	0.994
27.40	69	1.156
27.46	63	1.302
(27.56	(54)	(1.501)

Table 33. (Continued)

Station Os 5

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0315–0423	23	7	1956	52°32′N	175°04′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
25	06	41	083	25	23	2	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.4	18.24	32.95
10	7	7.28	18.24	32.95
25	〃	6.74	18.24	32.95
46	20	5.84	18.26	32.99
69	〃	4.80	18.34	33.13
92	〃	3.86	18.39	33.22
137	〃	3.82	18.44	33.31
181	〃	3.96	18.51	33.44
272	〃	4.10	18.65	33.69
369	〃	3.87	18.77	33.91
460	〃	3.82	18.82	34.00
554	〃	3.66	18.86	34.07
746	〃	3.31	18.95	34.23

Interpolated			Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	8.4	18.24	32.95	25.63	237	
10	7.28	18.24	32.95	25.79	222	0.023
25	6.74	18.24	32.95	25.86	215	0.056
50	5.70	18.28	33.03	26.05	197	0.108
75	4.20	18.36	33.17	26.33	171	0.179
100	3.83	18.40	33.24	26.43	161	0.221
150	3.85	18.46	33.35	26.51	154	0.300
200	4.01	18.54	33.49	26.61	144	0.375
300	4.08	18.68	33.75	26.80	126	0.512
400	3.83	18.79	33.95	26.98	109	0.632
500	3.79	18.84	34.04	27.06	101	0.741
600	3.51	18.88	34.11	27.15	93	0.842
800	(3.29)	(18.97)	34.27	(27.30)	(79)	(1.024)

Station Os 6

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2225–2346	23	7	1956	53°50′N	174°57′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
16	07	41	070	16	18	3	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		7.9	18.28	33.03
10	10	7.12	18.28	33.03
25	〃	6.71	18.29	33.04
49	〃	4.78	18.34	33.13
68	23	4.26	18.41	33.26
91	〃	3.95	18.44	33.31
133	〃	3.94	18.53	33.48
184	〃	3.83	18.62	33.64
260	32	3.90	18.72	33.82
347	〃	3.81	18.82	34.00
431	〃	3.72	18.85	34.05
519	〃	3.62	18.87	34.09
690	〃	3.45	18.95	34.23
868	〃	3.28	18.99	34.31
1049	〃	2.99	19.03	34.38
1340	〃	2.55	19.08	34.47

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	7.9	18.28	33.03	25.76	225	
10	7.12	18.28	33.03	25.87	214	0.022
25	6.71	18.29	33.04	25.94	208	0.054
50	4.73	18.34	33.13	26.25	178	0.102
75	4.10	18.42	33.28	26.43	161	0.145
100	3.95	18.46	33.35	26.50	154	0.185
150	3.91	18.57	33.55	26.66	139	0.259
200	3.84	18.65	33.69	26.78	128	0.326
300	3.89	18.77	33.91	26.95	112	0.448
400	3.75	18.84	34.04	27.06	101	0.557
500	3.64	18.87	34.09	27.12	96	0.659
600	3.55	18.91	34.16	27.18	90	0.756
800	3.33	18.98	34.29	27.31	78	0.934
1000	3.05	19.02	34.36	27.40	69	1.093
1200	2.76	19.05	34.42	27.46	63	1.240

Table 33. (Continued)

Station Os 7

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0756–0904	24	7	1956	55°00′N	175°00′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
16	08	01	072	16	16	3	10

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		7.7	18.30	33.06
10	10	7.53	18.30	33.06
25	〃	7.21	18.32	33.10
49	〃	3.72	18.33	33.12
71	18	3.28	18.35	33.15
95	〃	2.87	18.36	33.17
143	〃	2.61	18.46	33.35
190	〃	3.62	18.66	33.71
260	30	3.58	18.75	33.87
347	〃	3.69	18.80	33.96
432	〃	3.63	18.85	34.05
605	〃	3.41	18.91	34.16
775	〃	3.14	18.97	34.27
1046	〃	2.78	19.02	34.36
1250	〃	2.55	19.06	34.43

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σt	$10^5 \triangle st$	$\triangle D$
0	7.7	18.30	33.06	25.81	220	
10	7.53	18.30	33.06	25.84	217	0.022
25	7.21	18.32	33.10	25.88	213	0.054
50	3.70	18.33	33.12	26.34	170	0.102
75	3.13	18.35	33.15	26.43	161	0.143
100	2.80	18.36	33.17	26.47	157	0.183
150	2.63	18.48	33.39	26.65	140	0.257
200	3.63	18.70	33.78	26.88	118	0.322
300	3.63	18.78	33.93	26.99	108	0.437
400	3.65	18.83	34.02	27.06	101	0.544
500	3.57	18.88	34.11	27.14	94	0.645
600	3.42	18.91	34.16	27.20	88	0.740
800	3.10	18.98	34.29	27.33	76	0.914
1000	2.91	19.02	34.36	27.40	69	1.071
1200	2.59	19.05	34.42	27.48	62	1.215

Station Os 8

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0208–0256	25	7	1956	55°00′N	177°10′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
04	07	44	108	04	11	3	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.8	18.35	33.15
10	9	8.08	18.35	33.15
25	〃	7.60	18.35	33.15
49	〃	4.11	18.40	33.24
66	28	3.39	18.41	33.26
88	〃	2.98	18.42	33.28
132	〃	2.44	18.43	33.30
177	〃	2.55	18.43	33.30
225	41	3.68	18.68	33.75
304	〃	3.69	18.78	33.93
383	〃	3.61	18.83	34.02
462	〃	3.61	18.88	34.11
630	〃	3.33	18.94	34.22
807	〃	3.08	18.98	34.29
1089	〃	2.66	19.05	34.42

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σt	$10^5 \triangle st$	$\triangle D$
0	8.8	18.35	33.15	25.72	229	
10	8.08	18.35	33.15	25.83	218	0.022
25	7.60	18.35	33.15	25.90	211	0.054
50	4.05	18.40	33.24	26.40	164	0.101
75	3.17	18.41	33.26	26.50	154	0.141
100	2.75	18.42	33.28	26.56	149	0.179
150	2.43	18.43	33.30	26.60	145	0.253
200	3.10	18.51	33.44	26.66	139	0.325
300	3.69	18.77	33.91	26.97	110	0.463
400	3.61	18.84	34.04	27.08	99	0.570
500	3.56	18.90	34.14	27.17	91	0.667
600	3.30	18.95	34.23	27.27	81	0.757
800	3.09	18.98	34.29	27.33	76	0.924
1000	2.77	19.02	34.36	27.42	67	1.078
1200	(2.50)	(19.06)	(34.43)	(27.50	(60)	(1.218)

Table 33. (Continued)

Station Os 9

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1151–1243	25	7	1956	55°00′N	179°20′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
33	02	42	070	33	14	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		7.8	18.28	33.03
10	3	6.93	18.31	33.08
25	〃	6.84	18.34	33.13
50	〃	3.60	18.38	33.21
73	12	3.09	18.40	33.24
98	〃	2.74	18.44	33.31
147	〃	3.03	18.47	33.37
196	〃	3.51	18.69	33.77
270	26	3.68	18.80	33.96
361	〃	3.61	18.85	34.05
455	〃	3.53	18.90	34.14
540	〃	3.41	18.92	34.18
728	〃	3.26	18.99	34.31
920	〃	2.98	19.02	34.36
1117	〃	2.63	19.06	34.43
1416	〃	2.35	19.09	34.49

Interpolated / Computed

Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	7.8	18.28	33.03	25.78	223	
10	6.93	18.31	33.08	25.94	208	0.022
25	6.84	18.34	33.13	26.00	202	0.053
50	3.60	18.38	33.21	26.42	162	0.099
75	3.05	18.40	33.24	26.50	154	0.136
100	2.73	18.44	33.31	26.59	146	0.174
150	3.06	18.47	33.37	26.60	145	0.247
200	3.53	18.70	33.78	26.88	118	0.313
300	3.68	18.82	34.00	27.04	103	0.426
400	3.60	18.87	34.09	27.12	96	0.528
500	3.49	18.91	34.16	27.19	89	0.624
600	3.38	18.94	34.22	27.25	83	0.714
800	3.14	19.00	34.33	27.36	73	0.880
1000	2.82	19.04	34.40	27.44	65	1.030
1200	2.53	19.07	34.45	27.51	59	1.167
1500	2.30	19.10	34.51	27.58	52	1.355

Station Os 10

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2103–2255	25	7	1956	55°02′N	178°26′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
20	07	44	070	20	23	3	14

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.6	18.26	32.99
10	11	7.99	18.29	33.04
24	〃	7.30	18.31	33.08
49	〃	3.39	18.37	33.19
73	10	2.98	18.38	33.21
98	〃	2.72	18.41	33.26
148	〃	2.44	18.48	33.39
197	〃	3.43	18.66	33.71
290	14	3.61	18.80	33.96
389	〃	3.60	18.83	34.02
486	〃	3.42	18.90	34.14
581	〃	3.34	18.94	34.22
776	〃	3.17	19.00	34.33
975	〃	2.97	19.04	34.40
1121	〃	2.63	19.07	34.45
1469	〃	2.32	19.09	34.49

Interpolated / Computed

Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.6	18.26	32.99	25.62	238	
10	7.99	18.29	33.04	25.76	225	0.023
25	7.26	18.31	33.08	25.89	212	0.056
50	3.37	18.37	33.19	26.43	161	0.103
75	2.97	18.38	33.21	26.48	156	0.140
100	2.73	18.41	33.26	26.55	150	0.178
150	2.43	18.48	33.39	26.67	138	0.250
200	3.48	18.67	33.73	26.85	121	0.315
300	3.61	18.81	33.98	27.04	103	0.419
400	3.59	18.84	34.04	27.08	99	0.523
500	3.40	18.91	34.16	27.20	88	0.620
600	3.33	18.94	34.22	27.25	83	0.710
800	3.15	19.00	34.33	27.35	74	0.877
1000	2.94	19.04	34.40	27.43	66	1.029
1200	2.60	19.07	34.45	27.50	60	1.168
1500	2.31	19.09	34.49	27.56	54	1.361

Table 33. (Continued)

Station Os 11

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2131–2235	26	7	1956	53°32′N	178°27′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
22	20	01	081	22	20	3	14

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.2	18.36	33.17
10	10	7.80	18.36	33.17
25	〃	7.80	18.36	33.17
49	〃	4.20	18.40	33.24
69	21	4.02	18.41	33.26
93	〃	3.81	18.43	33.30
139	〃	2.75	18.46	33.35
185	〃	3.43	18.56	33.53
254	33	3.76	18.68	33.75
344	〃	3.68	18.77	33.91
433	〃	3.60	18.85	34.05
521	〃	3.49	18.90	34.14
700	〃	3.37	18.95	34.23
885	〃	3.11	19.02	34.36
1072	〃	2.80	19.05	34.42
1357	〃	2.46	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.2	18.36	33.17
10	7.80	18.36	33.17
25	7.80	18.36	33.17
50	4.18	18.40	33.24
75	3.96	18.42	33.28
100	3.55	18.43	33.30
150	2.86	18.48	33.39
200	3.48	18.60	33.60
300	3.75	18.73	33.84
400	3.62	18.82	34.00
500	3.51	18.89	34.13
600	3.43	18.93	34.20
800	3.28	18.99	34.31
1000	2.91	19.04	34.40
1200	2.62	19.07	34.45
1500	(2.35)	(19.10)	(34.51)

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.82	219	
25.89	212	0.022
25.89	212	0.054
26.40	164	0.101
26.45	159	0.142
26.50	154	0.181
26.63	142	0.256
26.75	131	0.325
26.90	117	0.450
27.05	102	0.562
27.16	92	0.662
27.23	85	0.755
27.33	76	0.926
27.43	66	1.080
27.50	60	1.219
(27.57)	(53)	(1.408)

Station Os 12

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0537–0605	27	7	1956	53°40′N	179°50′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
29	05	47	075	29	16	2	16

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.3	18.28	33.03
10	3	7.96	18.29	33.04
25	〃	7.73	18.29	33.04
50	〃	6.26	18.33	33.12
75	2	3.79	18.44	33.31
99	〃	3.78	18.48	33.39
148	〃	3.77	18.54	33.49
197	〃	3.85	18.65	33.69
296	〃	3.88	18.77	33.91
395	〃	3.54	18.87	34.09

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.3	18.28	33.03
10	7.96	18.29	33.04
25	7.73	18.29	33.04
50	6.26	18.33	33.12
75	3.79	18.44	33.31
100	3.78	18.48	33.39
150	3.77	18.54	33.49
200	3.86	18.65	33.69
300	3.87	18.77	33.91
400	3.52	18.88	34.11

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.70	230	
25.76	225	0.023
25.80	221	0.056
26.05	197	0.108
26.49	155	0.152
26.55	150	0.190
26.64	141	0.263
26.78	128	0.331
26.95	112	0.453
27.15	93	0.558

Table 33. (Continued)

Station Os 13

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1152–1242	27	7	1956	53°40′N	178°54′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
09	01	02	065	09	27	2	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		7.9	18.24	32.95
10	2	7.58	18.27	33.01
25	〃	7.46	18.28	33.03
50	〃	3.86	18.34	33.13
75	2	3.47	18.34	33.13
100	〃	2.72	18.40	33.24
150	〃	3.72	18.53	33.48
200	〃	3.82	—	—
300	0	3.70	18.77	33.91
400	〃	3.63	18.88	34.11
500	〃	3.51	18.89	34.13
600	〃	3.38	18.92	34.18
800	〃	3.25	18.97	34.27
1000	〃	2.96	19.01	34.34
1200	〃	2.64	19.06	34.43
1500	〃	2.28	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	7.9	18.24	32.95
10	7.58	18.27	33.01
25	7.46	18.28	33.03
50	3.86	18.34	33.13
75	3.47	18.34	33.13
100	2.72	18.40	33.24
150	3.72	18.53	33.48
200	3.82	18.63	33.66
300	3.70	18.77	33.91
400	3.63	18.88	34.11
500	3.51	18.89	34.13
600	3.38	18.92	34.18
800	3.25	18.97	34.27
1000	2.96	19.01	34.34
1200	2.64	19.06	34.43
1500	2.28	19.09	34.49

Computed

σ_t	$10^5\triangle$st	$\triangle$D
25.70	230	
25.78	223	0.023
25.82	219	0.056
26.34	170	0.105
26.37	167	0.147
26.53	152	0.187
26.62	143	0.261
26.75	131	0.330
26.96	111	0.453
27.14	94	0.558
27.16	92	0.654
27.22	86	0.749
27.30	79	0.924
27.39	70	1.085
27.49	61	1.229
27.56	54	1.423

Station Os 14

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1851–1939	27	7	1956	53°42′N	177°29′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
05	04	47	061	05	31	2	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.2	18.26	32.99
10	5	7.93	18.26	32.99
25	〃	6.79	18.28	33.03
50	〃	4.04	18.34	33.13
75	0	3.52	18.36	33.17
100	〃	2.97	18.40	33.24
150	〃	3.62	18.55	33.51
200	〃	3.80	18.65	33.69
300	3	3.72	18.76	33.89
400	〃	3.65	18.83	34.02
500	〃	3.53	18.88	34.11
600	〃	3.40	18.92	34.18
800	〃	3.24	18.98	34.29
999	〃	2.96	19.02	34.36
1199	〃	2.67	19.06	34.43
1499	〃	2.30	19.10	34.51

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.2	18.26	32.99
10	7.93	18.26	32.99
25	6.79	18.28	33.03
50	4.04	18.34	33.13
75	3.52	18.36	33.17
100	2.97	18.40	33.24
150	3.62	18.55	33.51
200	3.80	18.65	33.69
300	3.72	18.76	33.89
400	3.62	18.83	34.02
500	3.53	18.88	34.11
600	3.40	18.92	34.18
800	3.24	18.98	34.29
1000	2.96	19.02	34.36
1200	2.67	19.06	34.43
1500	2.30	19.10	34.51

Computed

σ_t	$10^5\triangle$st	$\triangle$D
25.68	232	
25.72	229	0.023
25.92	210	0.056
26.32	172	0.104
26.40	164	0.146
26.52	153	0.186
26.66	139	0.259
26.78	128	0.326
26.95	112	0.448
27.06	101	0.557
27.15	93	0.657
27.22	86	0.751
27.32	77	0.924
27.40	69	1.082
27.48	62	1.226
27.58	52	1.419

Tadel 33. (Continued)

Station Os 15

Time (G.M.T.)	Day	Month	Year	Latitutde	Longltude
0508–0554	28	7	1956	52°20′N	177°30′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
05	04	40	108	05	36	2	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.6	18.26	32.99
10	5	7.11	18.27	33.01
25	〃	6.79	18.29	33.04
50	〃	5.25	18.32	33.10
74	8	3.69	18.38	33.21
99	〃	3.73	18.45	33.33
149	8	3.67	18.51	33.44
198	〃	3.93	18.66	33.71
295	10	3.79	18.76	33.89
393	〃	3.73	18.81	33.98
490	〃	3.63	18.87	34.09
589	〃	3.55	18.92	34.18
787	〃	3.28	18.99	34.31
985	〃	3.05	19.00	34.33
1183	〃	2.69	19.03	34.38
1481	〃	2.36	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.6	18.26	32.99
10	7.11	18.27	33.01
25	6.79	18.29	33.04
50	5.25	18.32	33.10
75	3.68	18.38	33.21
100	3.73	18.45	33.33
150	3.67	18.51	33.44
200	3.94	18.66	33.71
300	3.78	18.76	33.89
400	3.73	18.82	34.00
500	3.62	18.88	34.11
600	3.53	18.93	34.20
800	3.26	18.99	34.31
1000	3.02	19.00	34.33
1200	2.66	19.04	34.40
1500	2.35	19.09	34.49

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.62	238	
25.85	216	0.023
25.93	209	0.055
26.16	187	0.105
26.42	162	0.149
26.51	154	0.189
26.60	145	0.264
26.78	128	0.333
26.95	112	0.455
27.04	103	0.565
27.13	95	0.667
27.22	86	0.762
27.33	76	0.934
27.37	72	1.094
27.45	64	1.244
27.55	55	1.445

Station Os 16

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1204–1259	28	7	1956	52°20′N	178°50′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
09	03	28	082	09	13	2	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.4	18.26	32.99
10	0	7.52	18.26	32.99
25	〃	7.09	18.28	33.03
50	〃	4.12	18.35	33.15
75	3	3.50	18.38	33.21
100	〃	3.14	18.42	33.28
150	〃	3.56	18.54	33.49
200	〃	3.76	18.63	33.64
296	2	3.77	18.77	33.91
394	〃	3.66	18.83	34.02
493	〃	3.54	18.89	34.13
592	〃	3.50	18.92	34.18
791	〃	3.19	18.97	34.27
990	〃	2.89	19.02	34.36
1289	〃	2.47	19.05	34.42

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.4	18.26	32.99
10	7.52	18.26	32.99
25	7.09	18.28	33.03
50	4.12	18.35	33.15
75	3.50	18.38	33.21
100	3.14	18.42	33.28
150	3.50	18.54	33.49
200	3.76	18.63	33.64
300	3.76	18.78	33.93
400	3.65	18.84	34.04
500	3.53	18.89	34.13
600	3.49	18.92	34.18
800	3.17	18.97	34.27
1000	2.88	19.02	34.36
1200	2.59	19.04	34.40

Computed

σ_t	$10^5\triangle st$	$\triangle D$
26.65	235	
25.78	223	0.023
25.87	214	0.056
26.33	171	0.104
26.43	162	0.146
26.53	152	0.185
26.66	139	0.258
26.76	130	0.326
26.97	110	0.448
27.07	100	0.556
27.16	92	0.655
27.20	88	0.749
27.31	79	0.925
27.41	68	1.083
27.46	63	1.228

Teble 33. (Continued)

Station Os 17

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1900–1933	28	7	1956	52°21′N	179°49′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
22	04	02	070	22	×	2	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		6.7	18.35	33.15
10	12	6.03	18.35	33.15
24	〃	5.49	18.38	33.21
49	〃	4.67	18.44	33.31
73	〃	4.30	18.49	33.40
97	〃	4.16	18.52	33.46
145	〃	4.13	18.52	33.46
193	〃	4.05	18.56	33.51

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	6.7	18.35	33.15
10	6.03	18.35	33.15
25	5.44	18.38	33.21
50	4.65	18.44	33.31
75	4.28	18.49	33.40
100	4.15	18.52	33.46
150	4.12	18.53	33.48
200	4.04	18.57	33.55

Computed

σ_t	$10^5\triangle st$	$\triangle D$
26.03	199	
26.11	191	0.020
26.22	181	0.048
26.40	164	0.091
26.51	154	0.131
26.56	149	0.169
26.58	147	0.243
26.65	140	0.315

Station Os 18

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0704–0815	29	7	1956	51°00′N	179°54′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
18	07	02	090	20	25	2	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.4	18.03	32.57
9	21	8.50	18.02	32.56
23	〃	6.79	18.05	32.61
46	〃	4.99	18.21	32.90
59	37	4.60	18.29	33.04
79	〃	4.41	18.37	33.19
118	〃	4.21	18.46	33.35
158	〃	4.21	18.47	33.37
282	60	4.07	18.73	33.84
353	〃	4.06	18.82	34.00
423	〃	3.90	18.85	34.05
494	〃	3.77	18.89	34.13
640	〃	3.50	18.95	34.23
788	〃	3.31	18.98	34.29
939	〃	3.03	19.00	34.33
1196	〃	2.61	19.04	34.40

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.4	18.03	32.57
10	8.51	18.02	32.56
25	6.60	18.05	32.61
50	4.85	18.24	32.95
75	4.44	18.36	33.17
100	4.28	18.43	33.30
150	4.21	18.47	33.37
200	4.19	18.53	33.48
300	4.06	18.76	33.89
400	3.93	18.84	34.04
500	3.77	18.90	34.14
600	3.59	18.94	34.22
800	3.30	18.98	34.29
1000	2.94	19.01	34.34
1200	2.60	19.04	34.40

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.33	266	
25.30	268	0.027
25.61	239	0.065
26.10	192	0.119
26.31	172	0.165
26.42	162	0.207
26.49	155	0.287
26.58	147	0.363
26.92	115	0.496
27.04	103	0.608
27.15	93	0.710
27.22	86	0.804
27.31	78	0.978
27.39	70	1.138
27.47	62	1.284

Teble 33. (Continued)

Station Os 19

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2232–2331	29	7	1956	52°24′N	178°30′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
18	07	43	088	18	18	2	17

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.4	18.28	33.03
9	19	7.55	18.30	33.06
23	〃	6.38	18.37	33.19
47	〃	4.15	18.42	33.28
62	34	4.06	18.43	33.30
83	〃	4.00	18.44	33.31
124	〃	3.81	18.45	33.33
168	〃	4.04	18.54	33.49
200	60	3.80	18.62	33.64
250	〃	3.80	18.66	33.71
300	〃	3.78	18.70	33.78
338	〃	3.75	18.72	33.82
400	〃	3.67	18.77	33.91
470	〃	3.59	18.83	34.02
534	〃	3.51	18.88	34.11
679	〃	3.28	18.92	34.18

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.4	18.28	33.03
10	7.45	18.30	33.06
25	6.25	18.37	33.19
50	4.14	18.42	33.28
75	4.09	18.44	33.31
100	3.88	18.44	33.31
150	3.90	18.49	33.40
200	3.80	18.62	33.64
300	3.78	18.70	33.78
400	3.67	18.77	33.91
500	3.54	18.86	34.07
600	3.42	18.91	34.16

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.68	232	
25.85	216	0.022
26.12	191	0.053
26.43	161	0.097
26.47	157	0.137
26.48	156	0.176
26.55	150	0.253
26.74	132	0.324
26.86	120	0.452
26.97	110	0.570
27.12	96	0.676
27.20	88	0.772

Station Os 20

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2025–2213	30	7	1956	53°45′N	176°20′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
20	07	61	092	22	22	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.1	18.18	32.84
10	9	8.70	18.22	32.92
25	〃	8.00	18.35	33.15
49	〃	4.19	18.38	33.21
71	17	3.97	18.40	33.24
95	〃	3.50	18.43	33.30
143	〃	3.29	18.44	33.31
190	〃	3.30	18.45	33.33
257	30	3.69	18.71	33.80
341	〃	3.66	18.79	33.95
429	〃	3.62	18.87	34.09
513	〃	3.46	18.89	34.13
687	〃	3.34	18.95	34.23
861	〃	3.04	19.01	34.34
1049	〃	2.77	19.05	34.42
1339	〃	2.44	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	9.1	18.18	32.84
10	8.70	18.22	32.92
25	8.00	18.35	33.15
50	4.18	18.38	33.21
75	3.90	18.40	33.24
100	3.46	18.43	33.30
150	3.28	18.44	33.31
200	3.34	18.46	33.35
300	3.71	18.76	33.89
400	3.65	18.84	34.04
500	3.49	18.88	34.11
600	3.40	18.91	34.16
800	3.17	18.99	34.31
1000	2.83	19.04	34.40
1200	2.59	19.07	34.45

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.44	255	
25.55	245	0.025
25.84	217	0.060
26.36	168	0.108
26.42	162	0.149
26.50	154	0.189
26.54	151	0.266
26.56	149	0.341
26.95	112	0.473
27.08	99	0.581
27.15	93	0.681
27.20	88	0.775
27.34	75	0.948
27.44	65	1.100
27.50	60	1.238

Teble 33. (Continued)

Station Os 21

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0800–0905	31	7	1956	55°00′N	176°20′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
07	04	02	075	07	×	3	9.5

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.7	18.16	32.81
10	0	8.68	18.19	32.86
25	〃	7.68	18.29	33.04
50	〃	3.73	18.39	33.22
75	〃	3.39	18.40	33.24
99	7	3.00	18.43	33.30
149	〃	2.87	18.47	33.37
198	〃	2.69	18.62	33.64
286	18	3.71	18.74	33.86
380	〃	3.62	18.82	34.00
475	〃	3.53	18.89	34.13
570	〃	3.39	18.93	34.20
768	〃	3.19	18.99	34.31
966	〃	2.90	19.04	34.40
1160	〃	2.70	19.06	34.43
1459	〃	2.29	19.08	34.47
2055	〃	1.97	19.14	34.58
2352	〃	1.77	19.17	34.63

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.7	18.16	32.81
10	8.68	18.19	32.86
25	7.68	18.29	33.04
50	3.73	18.39	33.22
75	3.39	18.40	33.24
100	2.99	18.44	33.31
150	2.87	18.46	33.35
200	3.70	18.62	33.64
300	3.70	18.70	33.78
400	3.60	18.84	34.04
500	3.49	18.90	34.14
600	3.37	18.94	34.22
800	3.15	19.00	34.33
1000	2.85	19.05	34.42
1200	2.64	19.06	34.43
1500	2.27	19.08	34.47
2000	2.00	19.14	34.58

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.47	252	
25.51	248	0.025
25.80	221	0.060
26.42	162	0.108
26.47	157	0.148
26.56	149	0.186
26.61	144	0.259
26.75	131	0.328
26.86	120	0.455
27.08	99	0.568
27.18	90	0.666
27.25	83	0.757
27.36	73	0.923
27.45	64	1.072
27.49	61	1.210
27.55	55	1.405
27.66	45	

Station Os 22

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0349–0528	1	8	1956	56°35′N	177°18′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	06	02	075	27	29	3	10

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.1	18.30	33.06
10	10	9.07	18.32	33.10
25	〃	8.09	18.32	33.10
49	〃	3.94	18.38	33.21
71	17	3.58	18.40	33.24
95	〃	3.09	18.42	33.28
143	〃	2.44	18.43	33.30
190	〃	2.90	18.49	33.40
282	18	3.70	18.72	33.82
380	〃	3.59	18.79	33.95
469	〃	3.51	18.85	34.05
585	〃	3.45	18.87	34.09
751	〃	3.24	18.98	34.29
943	〃	2.94	19.04	34.40
1133	〃	2.62	19.05	34.42
1429	〃	——	19.08	34.52

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	9.1	18.30	33.06
10	9.07	18.32	33.10
25	8.09	18.32	33.10
50	3.92	18.38	33.21
75	3.50	18.40	33.24
100	2.99	18.42	33.28
150	2.42	18.43	33.30
200	3.15	18.51	33.44
300	3.70	18.74	33.86
400	3.56	18.81	33.98
500	3.50	18.87	34.09
600	3.43	18.90	34.14
800	3.19	19.01	34.34
1000	2.83	19.04	34.40
1200	2.56	19.06	34.43
1500	—	19.08	34.47

Computed

σ_t	$10^5\triangle st$	$\triangle D$
25.60	240	
25.63	237	0.024
25.64	236	0.060
26.39	165	0.110
26.46	158	0.150
26.54	151	0.189
26.60	145	0.263
26.65	140	0.335
26.93	114	0.464
27.03	104	0.576
27.14	94	0.678
27.18	90	0.774
27.36	73	0.947
27.44	65	1.097
27.50	60	1.235

Teble 33. (Continued)

Station Os 23

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0243–0515	2	8	1956	58°12′N	177°16′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
25	08	02	080	25	27	3	9

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.8	18.19	32.86
9	19	8.72	18.17	32.83
23	〃	8.59	18.19	32.86
47	〃	3.25	18.26	32.99
60	35	3.27	18.31	33.08
81	〃	2.64	18.32	33.10
121	〃	2.80	18.37	33.19
162	〃	2.75	18.42	33.28
262	46	2.38	18.44	33.31
337	〃	3.68	18.61	33.62
411	〃	3.71	18.70	33.78
485	〃	3.62	18.76	33.89
636	〃	3.42	18.86	34.07
800	〃	3.26	18.94	34.22
975	〃	2.96	19.00	34.33
1243	〃	2.61	19.05	34.42

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.8	18.19	32.86
10	8.71	18.17	32.83
25	8.55	18.19	32.86
50	3.25	18.29	33.04
75	3.00	18.32	33.10
100	2.65	18.34	33.13
150	2.81	18.41	33.26
200	2.56	18.44	33.31
300	3.28	18.57	33.55
400	3.73	18.68	33.75
500	3.60	18.77	33.91
600	3.47	18.84	34.04
800	3.26	18.94	34.22
1000	2.90	19.00	34.33
1200	2.64	19.04	34.40

Computed

σ_t	$10^5\triangle$st	$\triangle$D
25.50	249	
25.48	251	0.025
25.53	247	0.062
26.33	171	0.114
26.39	165	0.156
26.45	159	0.197
26.54	151	0.275
26.60	145	0.349
26.72	134	0.490
26.83	123	0.621
26.98	109	0.740
27.10	98	0.847
27.26	82	1.037
27.38	71	1.202
27.46	63	1.350

Station Os 24

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1753–1846	2	8	1956	59°47′N	179°17′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
22	07	46	087	22	27	3	11

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.7	18.10	32.70
10	6	8.40	18.11	32.72
25	〃	4.67	18.25	32.97
50	〃	3.05	18.28	33.03
73	9	2.49	18.34	33.13
98	〃	2.65	18.37	33.19
148	〃	2.48	18.39	33.22
197	〃	2.09	18.40	33.24
282	22	2.76	18.50	33.42
380	〃	3.62	18.66	33.71
474	〃	3.64	18.77	33.91
571	〃	3.51	18.81	33.98
762	〃	3.35	18.93	34.20
960	〃	3.05	18.97	34.27
1156	〃	2.72	19.02	34.36
1452	〃	2.39	19.07	34.45

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.7	18.10	32.70
10	8.40	18.11	32.72
25	4.67	18.25	32.97
50	3.05	18.28	33.03
75	2.49	18.34	33.13
100	2.66	18.37	33.19
150	2.44	18.39	33.22
200	2.08	18.40	33.24
300	3.23	18.58	33.57
400	3.65	18.70	33.78
500	3.62	18.78	33.93
600	3.49	18.83	34.02
800	3.30	18.94	34.22
1000	3.00	18.99	34.31
1200	2.64	19.03	34.38
1500	(2.37)	(19.08)	(34.47)

Computed

σ_t	$10^5\triangle$st	$\triangle$D
25.38	261	
25.44	255	0.026
26.12	191	0.059
26.33	171	0.104
26.46	158	0.145
26.50	154	0.184
26.54	151	0.260
26.58	147	0.335
26.75	131	0.475
26.87	119	0.602
26.99	108	0.719
27.08	99	0.827
27.25	83	1.020
27.36	73	1.188
27.44	65	1.340
(27.54)	(56)	(1.544)

Teble 33. (Continued)

Station Os 25

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0202–0254	3	8	1756	60°45′N	179°56′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	03	51	098	25	22	3	17

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.7	17.84	32.23
10	4	8.43	17.97	32.47
25	〃	5.39	18.23	32.94
50	〃	2.94	18.28	33.03
75	0	2.37	18.39	33.22
100	〃	2.42	18.40	33.24
150	〃	2.19	18.43	33.30
200	〃	1.86	18.43	33.30
292	8	3.14	18.59	33.58
390	〃	3.65	18.68	33.75
487	〃	3.64	18.73	33.84
583	〃	3.53	18.80	33.96
780	〃	3.30	18.92	34.18
979	〃	3.02	18.97	34.27

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	9.7	17.84	32.23
10	8.43	17.97	32.47
25	5.39	18.23	32.94
50	2.94	18.28	33.03
75	2.37	18.39	33.22
100	2.42	18.40	33.24
150	2.19	18.43	33.30
200	1.86	18.43	33.30
300	3.17	18.59	33.58
400	3.65	18.69	33.77
500	3.62	18.74	33.86
600	3.50	18.82	34.00
800	3.28	18.92	34.18
1000	3.00	18.98	34.29

Computed

σ_t	$10^5\triangle$st	$\triangle$D
24.88	308	
25.25	273	0.029
26.01	201	0.065
26.34	170	0.111
26.54	151	0.150
26.55	150	0.183
26.61	144	0.262
26.64	141	0.334
26.78	128	0.470
26.87	119	0.593
26.93	114	0.713
27.06	101	0.825
27.22	86	1.022
27.34	75	1.195

Station Os 26

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0738–0832	3	8	1956	61°22′N	179°40′E

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	02	45	096	23	23	3	18

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.8	17.53	31.67
10	10	7.96	17.52	31.65
25	〃	2.94	17.73	32.03
49	〃	−1.02	17.83	32.21
73	〃	0.73	18.03	32.57
98	〃	0.85	18.21	32.90
148	〃	1.55	18.28	33.03

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	8.8	17.53	31.67
10	7.96	17.52	31.65
25	2.94	17.73	32.03
50	−1.03	17.83	32.21
75	0.74	18.03	32.57
100	0.87	18.21	32.90
150	1.59	18.28	33.03

Computed

σ_t	$10^5\triangle$st	$\triangle$D
24.56	339	
24.67	328	0.033
25.55	245	0.076
25.92	210	0.133
26.13	190	0.183
26.39	165	0.227
26.44	160	0.308

Teble 33. (Continued)

Station Os 27

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0030–0110	4	8	1956	61°44′N	178°28′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	07	44	030	27	23	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.4	16.86	30.46
10	7	8.58	16.86	30.46
25	〃	1.78	17.35	31.35
50	〃	—1.47	17.32	31.29
75	〃	—1.45	17.89	32.32
99	〃	0.66	18.11	32.72
119	〃	0.78	18.13	32.75

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	9.4	16.86	30.46	23.52	438	
10	8.58	16.86	30.46	23.66	425	0.043
25	1.78	17.35	31.35	25.10	287	0.096
50	—1.47	17.32	31.29	25.19	279	0.167
75	—1.45	17.89	32.32	26.01	201	0.227
100	0.67	18.11	32.72	26.25	178	0.274

Station Os 28

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1041–1117	4	8	1956	62°10′N	176°45′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
22	06	45	075	22	22	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.0	17.16	31.00
10	14	8.32	17.16	31.00
24	〃	7.55	17.24	31.15
49	〃	—1.60	17.83	32.21
73	〃	—1.60	17.95	32.43
97	〃	—1.67	17.96	32.45

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.0	17.16	31.00	24.16	377	
10	8.32	17.16	31.00	24.12	381	0.038
25	7.55	17.24	31.15	25.04	293	0.089
50	—1.60	17.83	32.21	25.94	208	0.152
75	—1.60	17.95	32.43	26.11	191	0.202
100	—1.68	17.96	32.45	26.12	191	0.250

Teble 33. (Continued)

Station Os 29

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1726–1749	4	8	1956	62°33′N	174°56′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	07	44	070	23	23	3	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.6	17.51	31.64
10	10	8.41	17.52	31.65
25	〃	2.29	17.52	31.65
49	〃	−1.66	17.96	32.45
69	〃	−1.69	17.98	32.48

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.6	17.51	31.64	24.56	339	
10	8.41	17.52	31.65	24.61	334	0.034
25	2.29	17.52	31.65	25.32	267	0.079
50	−1.66	17.96	31.45	26.12	191	0.136

Station Os 30

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0335–0409	5	8	1956	63°03′N	172°54′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
20	10	96	080	20	23	3	17

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.7	17.68	31.94
10	6	8.06	17.69	31.96
25	〃	4.28	17.68	31.94
50	〃	−1.39	17.99	32.50
60	〃	−1.62	17.99	32.50

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	9.7	17.68	31.94	24.63	332	
10	8.06	17.69	31.96	24.90	307	0.032
25	4.28	17.68	31.94	25.35	264	0.075
50	−1.39	17.99	32.50	26.16	187	0.131

Station Os 31

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1320–1341	5	8	1956	62°38′N	171°20′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
20	13	61	090	20	18	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.8	17.43	31.49
9	20	8.90	17.54	31.69
23	〃	7.99	17.69	31.96
47	〃	0.61	17.94	32.41

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.8	17.43	31.49	24.42	352	
10	8.90	17.54	31.69	24.56	339	0.035
25	7.60	17.70	31.96	24.98	299	0.083
50	0.10	17.96	32.41	26.06	196	0.145

Station Os 32

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2000–2025	5	8	1956	62°15′N	169°36′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	14	02	088	23	20	3	17

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.6	17.40	31.44
10	17	8.27	17.43	31.49
19	〃	8.23	17.56	31.73
29	〃	−0.53	17.82	32.20

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.6	17.40	31.44	24.41	353	
10	8.27	17.43	31.49	24.50	345	0.030
25	1.00	17.68	31.94	25.62	238	0.074

Teble 33. (Continued)

Station Os 33

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0406–0427	6	8	1956	61°26′N	168°58′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	14	61	079	23	23	3	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.1	17.36	31.36
9	22	7.70	17.37	31.38
23	〃	6.29	17.38	31.40
32	〃	6.21	17.38	31.40

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.1	17.36	31.36	23.72	419	
10	7.65	17.37	31.38	24.51	344	0.038
25	6.24	17.38	31.40	24.82	314	0.087

Station Os 34

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1834–1850	6	8	1956	60°20′N	169°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
29	05	40	070	29	23	3	10

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		6.3	17.30	31.26
10	14	5.96	17.30	31.26
24	〃	5.83	17.30	31.26
34	〃	5.80	17.30	31.26

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	6.3	17.30	31.26	24.59	336	
10	5.96	17.30	31.26	24.62	333	0.033
25	5.82	17.30	31.26	24.64	331	0.083

Station Os 35

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0242–0255	8	8	1956	59°24′N	169°33′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
31	02	01	089	31	25	3	16

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.0	17.51	31.64
10	0	7.25	17.52	31.65
25	〃	4.81	17.52	31.65
55	〃	2.89	17.52	31.65

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	9.0	17.51	31.64	24.50	345	
10	7.25	17.52	31.65	24.78	318	0.033
25	4.81	17.52	31.65	25.07	290	0.079
50	2.89	17.52	31.65	25.25	273	0.149

Station Os 36

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1820–1849	8	8	1956	58°30′N	170°41′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
02	05	02	079	25	23	3	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.7	17.48	31.58
10	7	7.57	17.50	31.62
25	〃	0.87	17.62	31.83
50	〃	−0.40	17.65	31.89
74	〃	−0.46	17.65	31.89

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	8.7	17.48	31.58	24.50	345	
10	7.57	17.50	31.62	24.70	326	0.034
25	0.87	17.62	31.83	25.54	246	0.077
50	−0.40	17.65	31.89	25.63	237	0.137
75	−0.46	17.65	31.89	25.64	236	0.171

Teble 33. (Continued)

Station Os 37

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1735–1858	9	8	1956	58°08′N	170°54′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
16	15	45	088	18	18	3	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		8.8	17.59	31.78
9	27	7.61	17.60	31.80
22	〃	6.77	17.60	31.80
44	〃	0.44	17.70	31.98
66	〃	0.42	17.70	31.98
80	〃	0.34	17.71	32.00

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle$st	$\triangle$D
0	8.8	17.59	31.78	24.65	330	
10	7.54	17.60	31.80	24.85	311	0.032
25	6.36	17.61	31.82	25.01	296	0.078
50	0.44	17.70	31.98	25.67	233	0.144
75	0.38	17.71	32.00	25.69	231	0.202

Station Os 38

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0022–0048	11	8	1956	57°30′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
20	14	02	102	20	23	3	12

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.2	17.81	32.18
10	18	8.75	17.81	32.18
24	〃	6.10	17.90	32.34
48	〃	3.24	18.03	32.57
71	〃	2.06	18.11	32.72
105	〃	3.01	18.18	32.84

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle$st	$\triangle$D
0	9.2	17.81	32.18	24.90	307	
10	8.75	17.81	32.18	24.98	299	0.030
25	6.00	17.91	32.36	25.49	250	0.066
50	3.12	18.04	32.59	25.93	204	0.150
75	2.00	18.12	32.74	26.18	185	0.199
100	2.75	18.17	32.83	26.20	183	0.245

Teble 33. (Continued)

Station Os 39

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1644–1820	11	8	1956	56°19′N	172°01′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
18	05	45	103	18	23	3	8

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		9.6	17.81	32.18
10	9	9.38	17.92	32.38
25	〃	7.56	18.17	32.83
49	〃	4.60	18.36	33.17
73	〃	3.58	18.36	33.17
98	10	3.18	18.41	33.26
148	〃	3.07	18.42	33.28
197	〃	3.25	18.48	33.39
297	10	3.74	18.64	33.68
396	〃	3.68	18.75	33.87
495	〃	3.56	18.83	34.02
594	〃	3.47	18.88	34.11
794	〃	3.18	18.95	34.23
992	〃	2.89	19.01	34.34
1191	〃	2.54	19.05	34.42

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	9.6	17.81	32.18	24.83	313	
10	9.38	17.92	32.38	25.02	295	0.030
25	7.56	18.17	32.83	25.65	235	0.070
50	4.56	18.36	33.17	26.21	182	0.122
75	3.56	18.36	33.17	26.25	178	0.167
100	3.17	18.41	33.26	26.51	154	0.209
150	3.07	18.42	33.28	26.53	152	0.286
200	3.27	18.49	33.40	26.61	144	0.310
300	3.75	18.64	33.68	26.78	128	0.448
400	3.67	18.75	33.87	26.94	113	0.571
500	3.55	18.84	34.04	27.09	98	0.685
600	3.46	18.89	34.13	27.17	91	0.789
800	3.17	18.95	34.23	27.29	80	0.970
1000	2.88	19.00	34.33	27.38	71	1.132
1200	2.53	19.01	34.34	27.42	67	1.283

Station Os 40

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0120–0320	12	8	1956	55°21′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
11	02	44	107	11	25	3	10

Observed

Depth (m)	Augle (°)	T (°C)	Cl (‰)	S (‰)
0		11.5	18.13	32.75
10	2	10.42	18.17	32.83
25	〃	8.29	18.19	32.86
50	〃	4.27	18.33	33.12
73	13	3.60	18.37	33.19
97	〃	3.49	18.43	33.30
146	〃	3.44	18.48	33.39
194	〃	3.49	18.50	33.42
287	18	3.66	18.61	33.62
379	〃	3.68	18.73	33.84
477	〃	3.61	18.82	34.00
570	〃	3.49	18.88	34.11
761	〃	3.24	18.95	34.23
950	〃	2.90	18.99	34.31
1141	〃	2.67	19.04	34.40
1424	〃	2.44	19.08	34.47

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	11.5	18.13	32.75	24.96	301	
10	10.42	18.17	32.83	25.21	277	0.029
25	8.29	18.19	32.86	25.57	243	0.068
50	4.27	18.33	33.12	26.28	175	0.121
75	3.58	18.37	33.19	26.40	164	0.163
100	3.48	18.46	33.35	26.54	151	0.202
150	3.44	18.48	33.39	26.58	147	0.277
200	3.50	18.51	33.44	26.62	143	0.350
300	3.68	18.63	33.66	26.77	129	0.488
400	3.66	18.75	33.87	26.94	113	0.611
500	3.59	18.84	34.04	27.08	99	0.720
600	3.45	18.89	34.13	27.16	92	0.820
800	3.17	18.99	34.31	27.34	75	0.977
1000	2.83	19.01	34.34	27.40	69	1.133
1200	2.61	19.05	34.42	27.47	62	1.278
1500	(2.39)	(19.09	(34.49)	(27.55	(55)	(1.410)

Teble 33. (Continued)

Station Os 41

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1208–1402	12	8	1956	54°10′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
34	02	47	100	34	23	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		10.9	18.17	32.83
10	0	9.88	18.19	32.86
25	〃	6.85	18.38	33.21
50	〃	4.47	18.41	33.26
75	0	4.16	18.45	33.33
100	〃	3.59	18.45	33.33
150	〃	3.36	18.48	33.39
200	〃	3.54	18.53	33.48
292	3	3.71	18.68	33.75
390	〃	3.64	18.78	33.93
489	〃	3.54	18.86	34.07
585	〃	3.40	18.89	34.13
765	〃	3.25	18.95	34.23
935	〃	2.96	19.00	34.33
1085	〃	2.70	19.03	34.38
1277	〃	2.45	19.06	34.43
1480	7	2.24	——	——

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	10.9	18.17	32.83	25.12	286	
10	9.88	18.19	32.86	25.33	266	0.028
25	6.85	18.38	33.21	26.05	197	0.063
50	4.47	18.41	33.26	26.38	166	0.108
75	4.16	18.45	33.33	26.46	158	0.149
100	3.59	18.45	33.33	26.52	153	0.188
150	3.36	18.48	33.39	26.59	146	0.263
200	3.54	18.53	33.48	26.64	141	0.335
300	3.71	18.69	33.77	26.85	121	0.468
400	3.62	18.78	33.93	26.99	108	0.585
500	3.53	18.87	34.09	27.13	95	0.690
600	3.39	18.89	34.13	27.18	90	0.790
800	3.20	18.96	34.25	27.30	79	0.968
1000	2.84	19.01	34.34	27.40	69	1.127
1200	2.60	19.05	34.42	27.47	62	1.271
1500	2.23	—	—			

Station Os 42

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
2131–2215	12	8	1956	53°00′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
29	05	43	110	29	18	2	12

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		11.0	18.26	32.99
10	5	10.68	18.26	32.99
25	〃	9.02	18.30	33.06
50	〃	5.33	18.38	33.21
73	11	4.11	18.39	33.22
98	〃	3.89	18.43	33.30
148	〃	3.35	18.46	33.35
197	〃	3.51	18.52	33.46
295	10	3.80	18.67	33.73
392	〃	3.73	18.75	33.87
490	〃	3.69	18.81	33.98
588	〃	3.57	18.85	34.05
781	〃	3.40	18.93	34.20
970	〃	3.00	19.00	34.33

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\Delta st$	ΔD
0	11.0	18.26	32.99	25.23	275	
10	10.68	18.26	32.99	25.29	269	0.027
25	9.02	18.30	33.06	25.62	238	0.065
50	5.33	18.38	33.21	26.23	180	0.117
75	4.07	18.39	33.22	26.39	165	0.160
100	3.87	18.43	33.30	26.47	157	0.200
150	3.34	18.46	33.35	26.56	149	0.277
200	3.53	18.53	33.48	26.64	141	0.350
300	3.82	18.68	33.75	26.82	124	0.484
400	3.73	18.75	33.87	26.94	113	0.605
500	3.67	18.81	33.98	27.03	104	0.717
600	3.56	18.86	34.07	27.11	97	0.821
800	3.35	18.94	34.22	27.25	83	1.010
1000	2.91	19.00	34.33	27.38	71	1.177

Teble 33. (Continued)

Station Os 43

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0329–0407	13	8	1956	52°27′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
29	04	47	090	29	07	5	13

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		7.8	18.37	33.19
10	14	7.26	18.37	33.19
24	〃	6.51	18.41	33.26
49	〃	5.97	18.43	33.30
73	〃	5.53	18.46	33.35
97	〃	5.42	18.46	33.35
146	〃	4.57	18.50	33.42
194	〃	4.19	18.56	33.52
291	〃	3.96	18.60	33.60
388	〃	3.81	18.66	33.71

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	7.8	18.37	33.19	25.90	211	
10	7.26	18.37	33.19	25.98	204	0.021
25	6.49	18.41	33.26	26.14	189	0.050
50	5.95	18.43	33.30	26.23	180	0.096
75	5.51	18.46	33.35	26.33	171	0.140
100	5.38	18.46	33.35	26.35	169	0.183
150	4.53	18.51	33.44	26.51	154	0.264
200	4.17	18.57	33.55	26.63	142	0.339
300	3.94	18.61	33.62	26.72	134	0.479
400	3.80	18.67	33.73	26.82	124	0.611

Station Os 44

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0819–1007	13	8	1956	51°50′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
25	07	02	100	25	13	2	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		10.6	17.89	32.32
10	6	8.65	17.99	32.50
25	〃	4.75	18.21	32.90
50	〃	4.39	18.34	33.13
70	20	4.32	18.41	33.26
94	〃	4.27	18.46	33.35
141	〃	4.30	18.51	33.44
188	〃	4.26	18.56	33.53
259	30	4.31	18.60	33.60
347	〃	4.58	18.71	33.80
431	〃	4.31	18.78	33.93
519	〃	4.15	18.85	34.05
698	〃	3.72	18.92	34.18
881	〃	3.29	19.00	34.33
1068	〃	2.94	19.02	34.36
1373	22	2.54	19.09	34.49

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	10.6	17.89	32.32	24.79	317	
10	8.65	17.99	32.50	25.23	275	0.030
25	4.75	18.21	32.90	26.06	196	0.065
50	4.39	18.34	33.13	26.28	175	0.112
75	4.30	18.41	33.26	26.40	164	0.155
100	4.27	18.47	33.37	26.48	156	0.195
150	4.30	18.52	33.46	26.55	150	0.272
200	4.26	18.57	33.55	26.62	143	0.346
300	4.44	18.65	33.69	26.72	134	0.487
400	4.48	18.76	33.89	26.87	119	0.617
500	4.15	18.84	34.04	27.02	105	0.733
600	3.98	18.89	34.13	27.11	97	0.839
800	3.46	18.95	34.23	27.25	83	1.030
1000	3.05	19.00	34.33	27.36	73	1.199
1200	2.82	19.05	34.42	27.46	63	1.350
1500	2.45	19.10	34.51	27.56	54	1.550

Table 33. (Continued)

Station Os 45

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1600–1705	13	8	1956	51°00′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	11	61	115	23	13	2	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		11.4	17.99	32.50
9	28	11.89	18.00	32.52
22	〃	9.97	18.09	32.68
44	〃	5.27	18.17	32.83
50	47	5.00	18.22	32.92
67	〃	4.54	18.24	32.95
95	53	3.57	18.31	33.08
139	〃	3.25	18.57	33.55
280	60	3.27	18.77	33.91
345	〃	3.34	18.81	33.98
410	〃	3.38	18.85	34.05
473	〃	3.40	18.88	34.11
600	〃	3.32	18.94	34.22
747	〃	3.16	19.00	34.33
900	〃	2.94	19.04	34.40
1140	〃	2.55	19.06	34.43

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	11.4	17.99	32.50
10	11.88	18.00	32.52
25	8.70	18.10	32.70
50	5.00	18.20	32.88
75	4.20	18.26	32.99
100	3.51	18.32	33.10
150	3.23	18.59	33.58
200	3.22	18.68	33.75
300	3.29	18.78	33.93
400	3.38	18.84	34.04
500	3.40	18.90	34.14
600	3.32	18.94	34.22
800	3.10	19.02	34.36
1000	2.79	19.05	34.42
1200	2.47	19.07	34.45

Computed

σ_t	$10^5\triangle st$	$\triangle D$
24.78	318	
24.71	325	0.022
25.39	260	0.066
26.02	200	0.124
26.19	184	0.172
26.34	170	0.216
26.76	130	0.291
26.89	117	0.353
27.02	105	0.466
27.10	98	0.570
27.19	89	0.666
27.25	83	0.751
27.39	70	0.904
27.46	63	1.039
27.51	59	1.175

Station Os 46

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0320–0529	14	8	1956	49°45′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
25	17	02	125	25	27	3	15

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		12.3	18.13	32.75
8	34	12.07	18.13	32.75
21	〃	10.39	18.16	32.81
41	〃	5.63	18.26	32.99
46	52	5.29	18.27	33.01
68	〃	4.20	18.28	33.03
92	〃	3.69	18.46	33.35
152	〃	3.39	18.67	33.73
192	63	3.43	18.73	33.84
277	〃	3.74	18.80	33.90
366	〃	3.69	18.87	34.09
405	〃	3.61	18.91	34.16
600	〃	3.50	18.95	34.23
730	〃	3.22	18.98	34.29
877	〃	2.95	19.03	34.38
1115	〃	2.60	19.06	34.43

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	12.3	18.13	32.75
10	11.95	18.13	32.75
25	9.50	18.17	32.83
50	5.00	18.27	33.01
75	4.00	18.32	33.10
100	3.62	18.48	33.39
150	3.40	18.68	33.75
200	3.49	18.74	33.86
300	3.75	18.82	34.00
400	3.62	18.91	34.16
500	3.53	18.94	34.22
600	3.50	18.95	34.23
800	3.10	19.00	34.33
1000	2.73	19.05	34.42
1200	(2.51	19.07	34.45)

Computed

σ_t	$10^5\triangle st$	$\triangle D$
24.81	315	
24.88	308	0.031
25.36	263	0.074
26.12	191	0.131
26.30	173	0.177
26.56	149	0.217
26.87	119	0.285
26.95	112	0.344
27.03	104	0.454
27.18	90	0.554
27.23	85	0.645
27.25	83	0.733
27.36	73	0.899
27.47	62	1.043
(27.51)	(59)	(1.177)

Table 33. (Continued)

Station Os 47

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1455–1655	14	8	1956	48°13′N	172°00′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	21	02	138	27	29	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		13.4	18.20	32.88
9	29	13.25	18.21	32.90
22	〃	10.50	18.25	32.97
43	〃	5.79	18.31	33.08
51	47	5.57	18.32	33.10
70	〃	5.25	18.32	33.10
108	〃	4.50	18.35	33.15
152	〃	3.74	18.56	33.53
162	65	3.64	18.60	33.60
226	〃	3.54	18.71	33.80
290	〃	3.52	18.76	33.89
350	〃	3.52	18.80	33.96
454	〃	3.68	18.87	34.09
550	〃	3.58	18.92	34.18
649	〃	3.45	18.95	34.23
797	〃	3.13	19.01	34.34

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	13.4	18.20	32.88	24.70	326	
10	13.10	18.21	32.90	24.77	319	0.032
25	9.50	18.25	32.97	25.48	251	0.075
50	5.59	18.32	33.10	26.12	191	0.130
75	5.14	18.32	33.10	26.18	185	0.177
100	4.67	18.34	33.13	26.26	177	0.222
150	3.78	18.55	33.51	26.64	141	0.302
200	3.55	18.67	33.73	26.84	122	0.368
300	3.52	18.77	33.91	26.99	108	0.485
400	3.60	18.83	34.02	27.06	101	0.592
500	3.65	18.90	34.14	27.16	92	0.692
600	3.50	18.94	34.22	27.24	84	0.784
800	3.12	19.01	34.34	27.37	72	0.950

Station Os 48

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
1705–1830	15	8	1956	47°38′N	176°21′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
34	10	02	131	34	32	3	12

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		14.0	18.16	32.81
10	5	14.21	18.16	32.81
25	〃	10.20	18.21	32.90
50	〃	6.43	18.32	33.10
73	9	5.58	18.32	33.10
98	〃	5.25	18.34	33.13
148	〃	4.63	18.52	33.46
197	〃	3.66	18.62	33.64
290	15	3.52	18.73	33.84
387	〃	3.52	18.80	33.96
481	〃	3.52	18.86	34.07
580	〃	3.42	18.90	34.14
770	〃	3.26	18.98	34.29
969	〃	2.92	19.04	34.40
1167	〃	2.58	19.07	34.45
1462	〃	2.31	19.09	34.49

Interpolated				Computed		
Depth (m)	T (°C)	Cl (‰)	S (‰)	σ_t	$10^5\triangle st$	$\triangle D$
0	14.0	18.16	32.81	24.52	343	
10	14.21	18.16	32.81	24.48	347	0.034
25	10.20	18.21	32.90	25.31	267	0.079
50	6.43	18.32	33.10	26.02	200	0.138
75	5.56	18.32	33.10	26.13	190	0.188
100	5.23	18.34	33.13	26.19	184	0.235
150	4.61	18.52	33.46	26.52	153	0.320
200	3.63	18.62	33.64	26.76	130	0.391
300	3.52	18.74	33.86	26.94	113	0.514
400	3.52	18.81	33.98	27.04	103	0.624
500	3.50	18.87	34.09	27.13	95	0.726
600	3.41	18.91	34.16	27.20	88	0.821
800	3.21	18.99	34.31	27.33	76	0.995
1000	2.87	19.04	34.40	27.44	65	1.148
1200	2.56	19.07	34.45	27.51	59	1.285
1500	2.29	19.09	34.49	27.56	54	1.476

Table 33. (Continued)

Station Os 49

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0919-1019	16	8	1956	47°10′N	179°35′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
27	01	02	169	27	25	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		16.9	18.05	32.61
10	3	16.77	18.05	32.61
25	〃	9.86	18.21	32.90
50	〃	6.21	18.32	33.10
75	0	6.01	18.34	33.13
100	〃	5.89	18.42	33.28
150	〃	5.28	18.52	33.46
200	〃	4.28	18.65	33.69
280	〃	3.82	18.73	33.84
378	〃	3.66	18.77	33.91
475	〃	3.61	18.84	34.04
573	〃	3.53	18.91	34.16
770	〃	3.31	18.97	34.27
969	〃	3.06	19.03	34.38
1166	〃	2.70	19.06	34.43
1461	〃	2.35	19.09	34.49

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	16.9	18.05	32.61
10	16.77	18.05	32.61
25	9.86	18.21	32.90
50	6.21	18.32	33.10
75	6.01	18.34	33.13
100	5.89	18.42	33.28
150	5.28	18.52	33.46
200	4.28	18.65	33.69
300	3.79	18.74	33.86
400	3.65	18.78	33.93
500	3.59	18.86	34.07
600	3.50	18.92	34.18
800	3.29	18.98	34.29
1000	3.00	19.03	34.38
1200	2.65	19.06	34.43
1500	2.30	19.09	34.49

Computed

σ_t	$10^5\Delta st$	ΔD
23.73	418	
23.75	416	0.042
25.36	263	0.093
26.05	197	0.151
26.10	192	0.200
26.22	181	0.247
26.45	159	0.333
26.73	133	0.407
26.92	115	0.533
26.99	108	0.647
27.11	97	0.753
27.20	88	0.849
27.31	78	1.025
27.40	69	1.184
27.49	61	1.327
27.56	54	1.521

Station Os 50

Time (G.M.T.)	Day	Month	Year	Latitutde	Longitude
0913-1104	17	8	1956	46°10′N	175°31′W

dd	ff	ww	TTT	dwdw	dsds	F	Tr
23	15	03	198	23	25	3	×

Observed

Depth (m)	Angle (°)	T (°C)	Cl (‰)	S (‰)
0		19.4	17.98	32.48
10	7	18.73	17.98	32.48
25	〃	9.36	18.27	33.01
50	〃	6.22	18.32	33.10
72	5	5.73	18.33	33.12
96	〃	5.28	18.42	33.28
145	〃	3.97	18.56	33.53
193	〃	3.63	18.64	33.68
290	14	3.38	18.73	33.84
388	〃	3.48	18.79	33.95
484	〃	3.66	18.87	34.09
581	〃	3.42	18.92	34.18
776	〃	3.12	18.98	34.29
969	〃	2.94	19.03	34.38
1165	〃	2.66	19.06	34.43
1460	〃	2.29	19.10	34.51
2052	〃	1.92	19.13	34.56

Interpolated

Depth (m)	T (°C)	Cl (‰)	S (‰)
0	19.4	17.98	32.48
10	18.73	17.98	32.48
25	9.36	18.27	33.01
50	6.22	18.32	33.10
75	5.70	18.36	33.17
100	5.20	18.42	33.28
150	3.92	18.57	33.55
200	3.61	18.65	33.69
300	3.38	18.74	33.86
400	3.50	18.79	33.95
500	3.65	18.88	34.11
600	3.40	18.93	34.20
800	3.10	18.99	34.31
1000	2.90	19.03	34.38
1200	2.60	19.07	34.45
1500	2.25	19.10	34.51
2000	1.95	19.13	34.56

Computed

σ_t	$10^5\Delta st$	ΔD
23.02	486	
23.20	469	0.048
25.52	248	0.102
26.05	197	0.158
26.17	186	0.206
26.31	172	0.251
26.66	139	0.329
26.80	126	0.396
26.96	111	0.516
27.02	105	0.626
27.13	95	0.729
27.23	85	0.823
27.34	75	0.993
27.42	67	1.147
27.50	60	1.287
27.58	52	1.473
27.65	45	1.752

8. Data on Oxygen, Phosphate, Silicate, Hydrogen-Ion Concentration and Light Scattering by Suspended Matter

(酸素，燐酸塩，硅酸塩，水素イオン濃度並に懸濁物による光の散乱度測定)

Dissolved oxygen was measured by H. Koto aboard the ship.

Phosphate, silicate and hydrogen-ion concentration were measured by S. Kanamori aboard the ship.

Light scattering in sample water was measured by M. Fukuda aboard the ship. The sample water was placed on the AKA phototube colorimeter (scattering meter). Precautions were taken to keep clean the glass of the sample container; the opacity of glass of the container occurs when chilled water from deeper layer is poured into it with result of lowering the value of light scattering (higher value of turbidity). Although the AKA standard No. 1 made of plastic used in the present cruise was the same one as used in the previous cruise in 1955, the data of the present cruise are given in relative intensities of light scattering of water in percentage as against this standard No. 1, not converted into Coleman's Nephros Unit, because of unavailability of Coleman's Unit for calibration.

Table 34. Data on oxygen, phosphate, silicate, pH-value and light scattering of water in 1956 cruise to the Bering Sea

Station Os 1

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.80	105	8.2	0.93	42	7.5
9			8.3	0.98	32	8.0
22	7.56	110	8.25	0.93	36	6.5
45	7.21	100	8.25	1.21	44	7.5
70	7.68	105	8.3	1.21	42	5.5
90	7.03	96	8.2	1.35	41	
139	4.58	61	8.0	1.86	51	3.5
163	2.63	35	7.9	1.88	64	3.0
236	1.19	16	7.7		75	6.5
346	0.96	13	7.6	2.51	86	6.0
420	0.65	9	7.6	2.58	92	4.5
497	0.55	7	7.65	2.68	93	3.5
670	0.56	7	7.7	2.74	100	3.0
851	0.51	7	7.7	2.31	111	4.0
1040	0.74	10	7.8	2.42	105	4.0
1335	0.86	7	7.7	2.37	117	5.0

Station Os 2

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.47	112	8.15	1.41		13.0
10	7.03	105	8.2	1.31		7.0
24	7.25	105	8.1	1.14		6.5
49	7.00	96	8.0	1.38		6.5
73	6.97	93	8.0	1.72		8.0
90	6.55	88	7.9	2.12		9.0
135	2.58	35	7.8	2.79		6.0
180	1.59	21	7.8	3.04		4.5
205	1.63	22	7.8	3.29		3.0
259	1.33	18	7.7	3.14		5.5
327	0.68	9	7.75	3.34		8.0
395	0.65	9	7.7	3.34		8.0
534	0.52	7	7.8	3.32		6.0
688	——	—	7.75	3.48		6.5
842	0.51	7	7.85	3.80		6.0
1100	0.63	8	7.9	3.70		6.5

Table 34. (Continued)

Station Os 3

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.39	109	8.1	1.31	15	9.0
10	6.89	100	8.1	1.06	16	6.0
25	7.12	100	8.0	1.61	28	7.0
50	7.70	105	8.05	1.87	37	6.5
75	6.76	91	8.0	2.64	40	9.0
99	6.29	84				9.0
149	3.98	54	7.6	2.98	60	7.5
198	2.90	39	7.8	2.50	59	8.0
248	2.21	27	7.9	2.79	61	10.0
330	1.13	15	7.8	3.12	65	8.0
412	——	—				7.5
495	0.61	8	7.8	3.24	69	5.0
660	0.47	6	7.9	3.24	97	6.0
828	0.69	9	7.8	3.28	98	5.5
1000	0.52	7	7.85	3.31	104	5.5
1280	0.71	9	7.85	3.31	112	5.5

Station Os 4

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.87	102	8.1	1.58	35	12.0
10	6.93	103	8.1	1.61	35	8.0
25	7.25	105	8.1	1.64	35	9.0
49	7.21	100	8.0	2.01	41	9.0
74	7.04	96	8.1	1.79	45	9.0
98	7.08	95	8.1	2.05	48	9.0
147	4.94	67	8.0	2.10	56	10.0
196	4.05	55	7.9	2.41	60	8.0
272	2.32	32	7.8	3.02	60	9.0
365	1.19	16	7.7	3.43	77	
460	1.28	17	7.5	3.16	80	6.5
551	0.81	11	7.65	3.54	83	7.0
740	0.63	8	7.7	3.48	89	7.5
930	0.83	11	7.7	3.48	106	7.0
1126	0.96	13	7.75	3.54	102	9.0
1425	0.84	11	7.8	3.42	110	8.5

Station Os 5

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.18	107	8.1	1.58	35	11.0
10	7.14	104	8.15	1.62	34	6.0
25	7.21	104	8.2	1.83	34	8.0
46	7.18	101	8.1	1.58	37	14.0
69	6.57	90	8.0	1.90	43	9.0
92	6.49	87	8.0	2.21	41	8.0
137	5.69	77	8.0	2.30	46	6.0
181	4.81	65	8.0	2.22	54	7.5
272	2.74	37	8.0	2.68	67	6.0
369	1.73	23	7.8	2.48	68	5.0
460	1.19	16	7.9	2.48	74	7.0
554	0.87	12	7.8	2.54	92	6.5
746	0.74	10	7.85	2.77	100	7.0

Station Os 6

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.28	107	8.2	1.53	31	15.0
10	7.37	107	8.15	1.34	25	9.0
25	7.27	104	8.2	1.44	27	10.5
49	6.81	98	8.1	1.78	36	6.5
68	6.13	83	8.1	2.87	46	8.0
91	5.84	79	8.0	3.11	48	7.0
133	4.51	61	8.0	3.32	55	7.5
184	3.73	50	7.8	3.95	58	7.5
260	2.47	33	7.8	3.89	66	5.0
347	1.26	17	7.7	4.08	69	
431	1.00	14	7.7	3.89	78	7.0
519	0.91	12	7.7	4.03	89	7.0
690	0.73	10				
868	0.86	12	7.8	4.22	101	5.0
1049	0.63	8	8.0	4.22	104	8.0
1340	0.82	11	8.0	4.50	117	5.0

Table 34. (Continued)

Station Os 7

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.02	103	8.1	1.69	38	10.0
10	7.09	104	8.1	1.64	38	6.0
25	7.16	104	8.1	1.58	38	7.0
49	7.25	97	8.05	1.96	40	8.0
71	7.38	98	8.05	2.01	41	6.0
95	7.36	97	8.1	2.08	41	8.0
143	5.84	76	8.0	2.44	47	7.0
190	2.84	38	7.8	2.78	70	6.0
260	1.63	22	7.8	2.55	67	6.0
347	1.32	18	7.8	2.51	70	8.0
432			7.8	2.81	79	5.0
605	0.70	9	7.8	2.89	88	6.0
775	0.67	9	7.85	2.89	95	6.0
1046	1.04	14	7.8	3.18	104	7.5
1250	0.63	8	7.9	3.18	85	7.0

Station Os 9

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.02	103	8.1			10.0
10	6.98	101	8.1			6.0
25	7.15	103	8.1			7.0
50	7.42	99	8.1			6.5
73	7.63	101	8.1			5.0
98	6.56	86	8.0			6.0
147	5.07	67	8.0			5.0
196	2.77	37	7.85			4.5
270	1.51	20	7.8			4.5
361	0.93	13	7.7			3.5
455	0.83	11	7.8			3.5
540	0.64	9	7.75			6.0
728	0.71	10	7.75			7.0
920	0.56	7	7.75			6.5
1117	0.80	11	7.8			5.5
1416	0.77	10	7.8			

Station Os 8

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.82	103	8.2	2.11	26	7.5
10	7.05	104	8.2	1.94	24	8.0
25	7.22	106	8.2	2.16	25	7.0
49	7.29	99	8.0	2.50	28	7.0
66	7.25	97	8.0	2.48	29	6.5
88	7.12	94	8.0	2.57	28	6.0
132	6.84	89	8.0	2.61	30	5.5
177	7.37	96	8.0	2.50	31	6.0
225	2.83	38	7.8	3.11	45	5.5
304	1.69	23	7.8	3.13	53	6.0
383	0.96	13	7.8	2.95	78	6.5
462	0.91	12	7.8	2.98	76	6.0
630	0.68	9	7.8	3.49	93	6.0
807	0.57	8	7.8	3.33	93	7.0
1089	0.57	8	7.85	3.60	109	5.0

Station Os 10

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.94	104	8.2	1.84	38	11.0
10	6.95	103	8.2	1.64	34	9.5
24	7.09	103	8.15	1.79	35	5.0
49	7.65	102	8.1	2.05	37	5.0
73	7.41	98	8.0	2.16	38	11.0
98	7.20	94	8.0	2.26	43	6.0
148	6.07	79	8.0	2.26	41	4.0
197	2.74	37	8.0	2.26	78	4.0
290	1.21	16	7.8	2.84	78	3.5
389	0.92	12	7.8	2.84	64	4.5
486	0.94	13	7.8	2.84	75	3.5
581	0.58	8	7.8	3.07	84	4.0
776	0.53	7	7.8	2.92	97	3.5
975	0.96	13	7.8	2.81	95	4.5
1171	0.65	9	7.8	2.97	103	3.5
1469	0.91	12	7.85	2.78	115	3.5

Table 34. (Continued)

Station Os 11

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.97	103	8.2	1.97	43	10.0
10	6.87	101	8.2	1.88	36	6.0
25	6.97	103	8.15	2.01	36	6.0
49	7.21	98	8.0	2.22	42	4.0
69	7.20	97	8.0	2.30	44	
93	6.76	91	8.0	2.23	43	
139	7.35	97	8.0	2.30	43	
185	4.66	62	7.9	2.66	52	
254	2.81	38	7.85	2.72	64	4.5
344	1.63	22	7.8	2.95	65	5.0
433	0.94	13	7.8	3.32	72	3.5
521	0.86	12	7.8	3.02	77	4.0
700	0.71	10	7.8	3.08	83	3.5
885	0.75	10	7.8	3.29	90	
1072	0.52	7	7.85	3.38	96	
1357	0.64	8	7.85	3.20	112	

Station Os 13

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.89	103				11.0
10	7.08	102				6.0
25	7.09	104				4.5
50	7.25	98				4.5
75	7.15	95				3.5
100	6.76	89				3.0
150	3.98	54				4.0
200	2.67	36				3.0
300	1.42	19				3.5
400	1.14	15				3.5
500	0.73	10				3.0
600	0.84	11				3.0
800	0.63	8				3.0
1000	0.48	6				4.0
1200	0.60	8				3.0
1500	0.79	10				3.0

Station Os 12

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.92	103	8.15	1.83	42	
10	7.11	105	8.2	1.83	42	
25	6.97	102	8.2	1.93	41	
50	7.09	101	8.15	1.94	42	
75	6.02	51	8.1	2.35	49	
99	5.34	51	8.0	2.40	51	
148	4.40	51	7.9	2.62	57	
197	3.01	41	7.8	2.80	64	
296	1.69	23	7.75	2.87	75	
395	1.14	15				

Station Os 14

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.91	103	8.1	1.76	32	
10	6.94	102	8.1	1.84	34	
25	7.10	102	8.1	1.89	35	
50	7.24	98	8.0	2.40	36	
75	6.94	93	8.0	2.45	38	
100	6.78	89	8.0	2.53	40	
150	4.21	57	7.9	2.95	51	
200	0.79	11	7.85	3.10	57	
300	1.56	21	7.8	3.23	65	
400	1.11	15	7.7	3.23	72	
500	0.82	11	7.7	3.33	79	
600	0.79	11	7.7	3.33	89	
800	0.63	8	7.7	3.08	93	
999	0.58	8	7.8	3.38	93	
1199	0.73	10	7.8	3.21	103	
1499	0.80	10	7.8	3.38	108	

Table 34. (Continued)

Station Os 15

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.04	105	8.2	1.96	32	
10	7.09	103	8.15	2.04	34	
25	7.22	104	8.2	2.14	34	
50	6.97	97	8.1	2.24	34	
74	6.43	86	8.0	2.22	37	
99	5.84	79	8.0	2.52	39	
149	4.63	62	7.9	2.68	40	
198	2.72	37	7.8	2.94	56	
295	1.83	25	7.7	3.16	56	
393	1.37	19	7.7	3.16	56	
490	0.82	11	7.7	3.08	77	
589	0.58	8	7.7	3.14	79	
787	0.66	9	7.7	3.16	89	
985	0.68	9	7.7	3.24	87	
1183	0.54	7	7.8	3.16	103	
1481	0.70	9	7.8	3.14	101	

Station Os 16

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.85	103	8.1	2.97	34	6.0
10	8.79	128	8.2	2.97	31	4.5
25	7.59	110	8.1	2.50	37	4.0
50	7.18	97	8.1	2.10	33	4.0
75	6.89	92	8.0	2.40	41	3.0
100	6.50	86	8.0	2.53	42	3.0
150	4.50	60	7.9	3.00	50	4.5
200	2.98	40	7.8	3.03	55	3.0
296	1.52	21	7.8	3.34	67	3.0
394	0.94	13	7.8	3.62	71	3.5
493	1.14	15	7.8	3.75	73	4.0
529	0.75	10	7.8	4.11	80	3.2
791	0.67	9	7.8	3.52	99	4.0
990	0.58	8	7.8	3.67	99	4.0
1289	0.64	8	7.8	3.71	102	

Station Os 17

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.79	98	8.1	2.13	37	
10	6.80	96	8.1	2.26	38	
24	6.58	92	8.0	2.31	40	
49	5.76	79	8.0	2.35	46	
73	5.14	70	8.0	2.35	48	
97	4.89	67	8.0	2.48	51	
145	4.81	65	8.0	2.51	51	
193	4.30	58	7.9	2.82	51	

Station Os 18

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.82	101	8.2	1.40	22	10.0
9	6.86	102	8.2	1.43	19	5.0
23	7.19	103	8.2	1.48	20	4.0
46	8.06	111	8.0	2.18	31	4.0
59	6.18	85	8.0	2.54	33	3.5
79	5.05	69	8.0	2.64	36	3.0
118	4.25	58	7.9	2.85	49	3.0
158	4.22	57	7.9	2.72	36	4.5
282	1.95	27	7.8	2.97	57	3.0
353	1.11	15	7.7	3.36	68	3.0
423	1.16	16	7.7	3.30	77	3.0
494	0.59	8	7.7	3.24	82	3.0
640	0.54	7	7.7	3.21	95	3.5
788	0.49	7	7.7	3.24	97	3.0
939	0.45	6	7.8	3.32	96	3.5
1196	0.60	8	7.8	3.24	106	3.0

Table 34. (Continued)

Station Os 19

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate –P (γg-at./L)	Silicate-Si (γg-at./L)	Light scattering
0	6.89	103	8.1	2.26	31	7.5
9	6.81	100	8.1	2.44	33	4.5
23	6.94	99	8.1	2.42	34	4.0
47	7.03	96	8.0	2.88	40	3.5
62	6.26	84	8.0	2.83	43	3.5
83	5.77	78	8.0	2.86	48	3.0
124	4.87	66	7.9	3.05	49	3.0
168	3.99	54	7.9	3.05	52	3.0
200	3.40	46	7.8	3.19	58	3.5
250	3.12	42	7.8	3.14	56	3.0
300	2.54	34	7.8	3.12	55	3.0
338	2.42	33	7.8	3.12	61	3.0
400	1.59	21	7.7	3.35	66	4.0
470	1.45	20	7.7	4.12		3.5
534	1.12	15	7.7	3.27	72	4.0
679	1.04	14	7.7	3.52	79	3.0

Station Os 21

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate –P (γg-at./L)	Silicate-Si (γg-at./L)	Light scattering
0	6.85	103	8.1	2.02	33	14.0
10	7.09	106	8.2	1.72	35	4.5
25	7.06	104	8.2	1.84	37	5.0
50	6.98	94	8.0	2.22	41	4.0
75	7.07	94	8.0	2.29	43	4.0
99	6.77	89	8.0	2.35	46	3.5
149	6.33	84	8.0	2.46	46	3.0
198	3.35	45	7.8	2.67	61	3.5
286	1.96	26	7.8	3.53	71	3.0
380	1.10	15	7.8	3.67	71	3.0
475	0.91	12	7.8	3.81	89	3.0
570	0.69	9	7.8	4.03	92	3.5
768	0.59	8	7.8	3.97	98	3.0
966	0.59	8	7.75	3.84	104	3.0
1160	0.61	8	7.75	3.94	115	3.0
1459	0.80	10	7.9	3.61	116	3.0
2055						
2352			7.9	3.45	181	

Station Os 20

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate –P (γg-at./L)	Silicate-Si (γg-at./L)	Light scattering
0	6.79	102	8.1	1.92	33	7.0
10	6.80	102	8.1	2.22	34	5.0
25	6.95	103	8.1	2.24	35	4.0
49	8.98	122	8.0	2.54	38	3.0
71	6.97	94	8.0	2.64	41	3.0
95	6.47	86	8.0	2.54	46	3.0
143	5.47	73	7.9	2.68	47	3.0
190	6.03	80	8.0	2.81	46	3.0
257	2.29	31	7.8	3.19	64	3.0
341	1.33	18	7.8	3.57	76	3.5
429	0.90	12	7.7	3.81	83	4.0
513	0.80	11	7.8	3.75	88	3.0
687	0.58	8	7.8	3.51	95	3.5
861	0.50	7	7.8	3.66	102	3.5
1049	0.68	9	7.8	3.69	109	3.5
1339	0.78	10	7.8	3.78	119	3.0

Station Os 22

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate –P (γg-at./L)	Silicate-Si (γg-at./L)	Light scattering
0	6.98	105	8.2	1.82	34	8.5
10	6.97	105	8.2	1.88	34	5.0
25	7.08	105	8.1	2.10	38	3.5
49	7.06	95	8.1	2.73	35	3.0
71	7.15	96	8.1	2.84	39	3.0
95	7.03	93	8.0	2.78	43	3.0
143	6.86	90	8.0	2.72	44	3.0
190	6.87	91	8.0	2.54	46	3.0
282	2.21	30	7.8	3.39	61	3.0
380	1.68	23	7.9	3.42	84	3.0
469	1.03	14	7.75	3.58	87	3.0
585	0.85	11	7.7	3.74	92	3.0
751	0.56	8	7.8	3.61	106	3.0
943	0.61	8	7.75	3.85	105	3.0
1133	0.57	8	7.8	3.79	110	3.0
1429	1.69		7.8	3.51	112	3.0

Table 34. (Continued)

Station Os 23

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scatteriug
0	7.00	105	8.3	1.01	3.7	8.0
9	7.02	105	8.3	1.00	6.6	5.0
23	7.06	105	8.3	1.07	12	5.0
47	7.22	95	8.1	2.08	18	4.5
60	7.08	94	8.0	2.31	28	3.0
81	6.74	88	8.0	2.43	33	3.5
121	6.46	85	8.0	2.62	36	3.0
162	6.49	85	8.0	2.68	37	3.5
262	6.28	82	8.0	2.57	69	3.0
337	3.37	45	7.9	3.02	59	3.0
411	2.27	31	7.9	3.04	47	3.0
485	1.73	23	7.85	3.36	52	3.0
636	0.86	12	7.8	3.36	77	3.0
800	0.61	8	7.8	3.66	81	3.0
975	0.59	8	7.75	3.63	95	3.0
1243	0.85	11	7.8	3.57	106	3.0

Station Os 24

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	8.70	130	8.3	0.99	1.8	5.0
10	6.99	104	8.4	0.93	4.0	4.0
25	7.88	108	8.25	1.62	9.2	4.0
50	7.15	94	8.1	2.59	24	3.0
73	6.65	87	8.0	2.91	24	3.0
98	6.74	88	8.0	2.68	38	3.0
148	6.68	87	8.0	2.84	41	3.0
197	6.62	86	8.0	2.96	42	3.0
282	5.07	67	7.9	3.18	47	2.5
380	2.73	37	7.8	3.30	61	3.5
474	1.68	23	7.7	3.59	63	3.0
571	1.06	14	7.7	3.73	80	3.0
762	0.66	9	7.7	3.97	84	3.0
960	0.50	7	7.7	3.78	94	
1156	0.55	7	7.8	3.67	102	4.0
1452	0.63	8	7.8	3.79	117	3.0

Station Os 25

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.74	102	8.4	0.65	2.2	5.5
10	6.80	101	8.3	0.69	1.7	3.5
25	7.63	105	8.3	1.18	2.5	5.0
50	7.24	95	8.1	2.02	13	3.0
75	7.03	91	8.0	2.44	35	3.5
100	6.87	89	8.0	2.66	40	3.0
150	6.73	87	7.9	2.78	39	3.0
200	6.73	87	7.9	2.72	40	3.0
292	3.94	52	7.8	3.04	50	3.0
390	3.41	46	7.8	3.31	55	4.0
487	1.58	21	7.65	3.46	71	3.0
583	1.17	16	7.7	3.52	76	3.0
780	0.76	10	7.65	3.49	83	3.0
979	0.59	8	7.7	3.72	93	3.0

Station Os 26

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.87	102	8.3	0.40	2.6	4.5
10	7.03	103	8.4	0.45	2.3	4.0
25	8.67	113	8.35	0.49	2.3	3.5
49	8.26	98	8.1	1.81	16	3.5
73	7.14	89	8.1	2.29	25	4.0
98	6.74	84	8.0	2.74	39	4.0
148	6.06	77	7.9	3.13	48	8.5

Table 34. (Continued)

Station Os 27

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.84	102	8.5	0.38	2.5	4.5
10	6.84	101	8.5	0.41	2.0	4.0
25	8.75	111	8.45	0.40	2.8	3.0
50	8.15	95	8.1	1.68	23	3.5
75	7.78	91	8.0	1.79	33	3.0
99	5.85	73	7.9	2.12	43	7.0
119	5.86	73	7.9	2.44	44	5.0

Station Os 28

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.90	100	8.5	0.35	6.0	5.5
10	6.91	101	8.5	0.39	3.9	4.0
24	7.06	102	8.5	0.38	4.0	4.5
49	7.54	88	7.9	1.74	18	4.0
73	6.07	71	7.8	1.64	34	9.0
97	6.04	71	7.8	1.37	43	

Station Os 29

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.90	102	8.5	0.39	3.4	5.0
10	6.86	101	8.45	0.38	3.8	3.5
25	10.04	129	8.4	0.29	4.7	4.0
49	6.20	72	7.9	2.02	31	7.5
69	5.84	68	7.7	1.97	29	9.5

Station Os 30

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.97	106	8.4	0.56	4.6	5.0
10	6.94	102	8.35	0.60	4.0	4.5
25	9.05	122	8.4	0.49	4.4	5.0
50	4.86	57	7.65	2.38	32	13.0
60	4.85	57	7.65	1.96	32	15.0

Station Os 31

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.83	102	8.3	0.48	6.2	4.5
9	6.74	100	8.35	0.49	6.1	4.0
23	6.93	101	8.3	0.53	6.0	3.5
47	7.23	89	8.0	0.83	18	9.0

Station Os 32

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.85	103	8.3	0.63	9.1	5.0
10	6.84	100	8.3	0.62	10	4.0
19	6.87	101	8.3	0.64	8.1	4.0
29	8.44	101	8.0	0.76	16	11.0

Table 34. (Continued)

Station Os 33

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0			8.1	0.60		9.0
9	6.99	101	8.1	0.57		5.0
23	7.02	99	8.1	0.62	15	10.0
32	7.96	112	8.0	0.61	15	10.0

Station Os 34

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.26	102	8.1	0.62	8.0	7.0
10	7.66	107	8.1	0.65	6.7	6.5
24	9.17	128	8.1	0.68	6.7	7.0
34	7.29	101	8.1	0.74	7.6	11.0

Station Os 35

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.91	118	8.3	0.64	10	6.0
10	7.83	113	8.3	0.57	8.8	5.0
25	7.78	106	8.2	0.77	9.3	7.0
55	7.98	104	8.1	0.99	11	

Station Os 36

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.03	104	8.2	0.70	5.0	7.5
10	7.77	112	8.3	0.63	4.5	4.2
25	7.62	95	8.0	1.67	20	9.0
50	7.03	84	8.0	1.94	26	13.0
74	7.03	84	7.9	1.96	28	15.0

Station Os 37

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	dH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.26	108				4.5
9	7.57	110				5.0
22	7.38	105				4.0
44	7.28	89				8.0
66	7.27	89				9.0
80	7.29	89				12.0

Station Os 38

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate -P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.97	105	8.3	0.51	4.1	10.0
10	7.06	105	8.3	0.42	3.7	5.0
24	9.06	128	8.25	0.68	5.7	4.5
48	6.50	86	8.0	1.82	18	4.5
71	5.47	70	7.9	2.41	43	6.5
105	6.54	86	8.1	1.98	26	4.0

Table 34. (Continued)

Station Os 39

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.03	107	8.3	0.49	4.8	8.0
10	7.17	108	8.4	0.43	4.4	6.5
25	6.88	100	8.2	1.50	20	4.5
49	6.40	88	8.1	2.20	39	4.0
73	7.03	94	8.0	2.23	44	3.0
98	6.73	89	8.0	2.31	44	3.5
148	6.50	86	8.0	2.49	45	
197	5.71	76	7.9	2.48	48	
297	3.09	42	7.8	2.94	60	
396	2.11	28	7.7	3.04	76	
495	1.38	19	7.7	3.09	77	
594	1.14	15	7.6	3.27	96	
794	0.70	9	7.6	3.37	105	
992	0.67	9	7.6	3.28	109	
1191	0.64	8	7.6	3.32	129	

Station Os 40

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.85	108	8.3	0.79	23	5.0
10	6.97	108	8.2	1.08	32	5.0
25	7.20	107	8.2	1.04	25	5.0
50	6.05	82	8.0	2.10	37	4.0
73	5.89	79	8.0	2.32	46	4.0
97	5.71	76	7.9	2.36	49	3.5
146	5.46	73	7.9	2.36	46	3.0
194	4.88	65	7.9	2.46	51	3.0
287	3.46	47	7.8	2.50	64	3.5
379	2.25	30	7.8	2.86	65	3.5
477	1.77	24	7.7	2.86	71	3.0
570	0.97	13	7.7	3.13	75	3.0
761	0.60	8	7.8	3.16	80	3.5
950	0.60	8	7.8	3.22	97	5.5
1141	0.60	8	7.8	3.30	132	3.5
1424	0.73	10		3.22	112	

Station Os 41

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.86	107	8.2	1.40	31	7.0
10	7.64	117	8.3	1.43	32	5.5
25	6.93	100	8.1	2.32	42	4.0
50	6.67	91	8.0	2.53	43	3.5
75	5.06	69	8.0	2.44	47	3.0
100	5.83	78	7.95	2.44	47	3.5
150	5.51	73	7.9	2.51	49	3.0
200	4.59	62	7.9	2.73	57	4.0
292	2.82	38	7.8	3.00	58	3.0
390	1.80	24	7.7	3.22	64	3.5
489	1.22	16	7.7	3.33	75	3.5
585	1.02	14	7.7	3.26	81	3.5
765	0.65	9	7.7	3.47	99	4.0
935	0.85	11	7.7	3.33	104	4.5
1085	0.61	8	7.7	3.25	114	3.5
1277	0.81	11	7.8	3.09	122	3.7

Station Os 42

Depth (m)	O_2 (ml/L)	O_2 sat. (%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.66	105	8.2	1.87	37	4.8
10	6.75	105	8.2	1.74	38	4.0
25	8.78	132	8.2	1.93	36	4.0
50	6.88	96	8.1	2.13	40	3.5
73	6.63	90	8.0	2.34	42	3.0
98	6.09	82	8.0	2.40	44	3.0
148	6.01	80	8.0	2.50	48	3.0
197	4.85	65	7.9	2.61	51	3.0
295	2.84	38	7.8	3.01	61	3.0
392	1.91	26	7.7	2.98	64	3.0
490	1.42	19	7.7	3.02	72	3.0
588	1.07	14	7.7	3.24	89	
781	0.70	9	7.7	3.29	98	
970	0.62	8	7.6	3.27	109	4.0
						4.0
						3.5

Table 34. (Continued)

Station Os 43

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.73	93	8.1	2.16	39	
10	6.79	99	8.1	2.17	41	
24	6.29	90	8.0	2.24	43	
49	5.96	84	8.0	2.34	45	
73	5.82	82	8.0	2.45	49	
97	5.68	79	8.0	2.47		
146	4.97	68	8.0	2.51	51	
194	4.68	64	7.9	2.63	54	
291	3.97	54	7.9	2.76	57	
388	3.22	44	7.9	2.80		
			7.85			

Station Os 44

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.86	106	8.3	0.60	8.2	7.0
10	7.26	108	8.3	0.87	9.1	4.5
25	5.74	79	8.0	1.95	31	4.0
50	4.90	67	7.9	2.19	34	3.0
70	4.53	62	7.9	2.41	45	4.0
94	4.24	58	7.9	2.49	45	3.5
141	3.98	54	7.9	2.54	49	3.5
188	3.67	50	7.85	2.62	51	3.5
259	3.23	44	7.8	2.66	53	3.5
347	2.20	30	7.8	2.89	52	3.5
431	1.77	24	7.7	3.04	58	3.0
519	0.84	11	7.7	3.17	68	3.5
698	0.58	8	7.6	3.31	75	3.0
881	0.55	7	7.7	3.43	99	3.0
1068	0.61	8	7.75	3.33	99	3.0
1373	1.02	18	7.8	3.21	103	3.5

Station Os 45

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.79	107	8.2	1.25	10	
9	6.38	102	8.2	1.06	10	4.0
22	6.85	105	8.2	1.20	11	4.0
44	7.37	102	8.2	1.42	15	4.0
50	9.25	128	8.1	1.71	14	4.0
67	7.49	103	8.1	1.91	34	3.5
95	6.65	89	8.0	2.14	36	3.0
139	4.73	63	7.9	2.50	48	
280	1.68	22	7.75	2.94	45	
345	1.26	17	7.8	3.12	48	
410	1.12	15	7.75	3.28	52	
473	0.96	13	7.7	3.28	82	
600	0.85	11	7.7	3.21	92	
747	0.80	11	7.7	3.23	93	
900	0.66	9	7.75	3.30	98	
1140	0.83	11	7.8	3.42	103	

Station Os 46

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate $-P$ (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.29	101	8.2	1.53	20	
8	6.37	102	8.2	1.47	20	5.0
21	7.22	112	8.2	1.54	23	4.5
41	7.20	101	8.2	1.78	30	4.0
46	7.11	99	8.1	1.90	32	
68	7.04	96	8.1	1.92	32	
92	5.81	78	8.0	2.14	38	
152	3.55	48	7.9	2.79	51	
192	2.52	34	7.75	2.94	56	
277	1.20	16	7.8	3.00	62	
366	0.88	12	7.75	3.17	67	
405	0.64	9	7.7	3.19	72	
600	0.79	11	7.7	3.19	72	
730	0.65	9	7.7	3.31	88	
877	0.71	9	7.75	3.24	90	
1115	0.79	10	7.8	3.22	99	

Table 34. (Continued)

Station Os 47

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.16	101	8.2	1.53	30	
9	6.27	103	8.2	1.38	27	
22	6.82	106	8.1	1.47	31	
43	7.12	100	8.1	1.79	30	
51	6.92	97	8.1	1.77	32	
70	6.91	96	8.1	1.90	34	
108	6.83	93	8.0	1.95	33	
152	5.35	72	7.9	2.22	42	
162			7.8	1.78	34	
226	3.25	44	7.7	2.58	50	
290	2.26	30	7.7	2.57	59	
350	1.43	19	7.7	2.88	68	
454	0.94	13	7.7	2.90	74	
550	0.81	11	7.7	2.78	77	
649	0.81	11	7.8	2.87	94	
797	0.66	9	7.8	2.93	99	

Station Os 48

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	6.13	102	8.2	1.34	30	
10	6.12	102	8.2	1.39	28	
25	7.29	113	8.2	1.43	28	
50	6.99	100	8.0	1.79	30	
73	6.94	97	8.1	1.88	32	
98	6.86	95	8.0	1.90	32	
148	6.25	86	8.0	2.03	33	
197	6.14	83	8.0	2.40	46	
290	2.96	40	8.2	2.90	60	
387	1.83	25	7.9	2.96	69	
481	1.38	19	7.8	3.19	71	
580	0.93	12	7.8	3.13	86	
770	0.63	8	7.8	3.00	90	
969	0.71	9	7.8	3.13	98	
1167	0.73	10	7.8	3.14	106	
1462	1.07	14	7.8	3.17	112	

Station Os 49

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	5.87	102	8.2	1.41	30	7.0
10	5.94	103	8.2	1.35	28	5.0
25	7.31	112	8.1	1.42	28	11.0
50	7.03	100	8.1	1.82	32	
75	6.90	98	8.1	1.92	30	
100	6.62	94	8.1	1.74	30	
150	5.88	82	8.0	1.92	33	5.0
200	5.09	70	7.9	2.36	41	5.0
280	3.28	44	7.8	2.74	51	7.0
378	2.22	30	7.8	3.00	58	5.5
475	1.43	20	7.7	3.08	64	5.0
573	1.06	14	7.6	3.24	65	5.5
770	0.82	11	7.6	3.24	74	5.0
969	1.21	16	7.6	3.15	69	5.0
1116			7.7			
1461	0.80	10	7.7	3.11	87	5.0

Station Os 50

Depth (m)	O_2 (ml/L)	O_2 sat.(%)	pH	Phosphate-P (μg-at./L)	Silicate-Si (μg-at./L)	Light scattering
0	7.09	129	8.2	1.19	30	
10	5.89	106	8.1	1.21	28	
25	7.01	106	8.2	1.55	31	
50	6.85	97	8.0	1.79	31	
72	6.65	94	8.1	1.83	31	
96	6.59	92	8.1	1.86	32	
145	6.39	87	8.0	2.26	41	
193	4.45	60	7.9	2.57	54	
290	2.99	40	7.8	2.80	54	
388	2.11	28	7.7	2.76	66	
484	1.50	20	7.7	3.02	72	
581	0.98	13	7.6	3.00	75	
776	0.78	10	7.7	3.02	88	
969	0.76	10	7.7	2.96	104	
1165	0.72	10		3.33	99	
1460	1.10	14	7.8	2.86	101	
2052				2.69	99	

9. Data on Measurement of Submarine Illumination
(海 中 照 度 記 録)

Solar radiation which travels downward through the sea water was measured by means of a luxmeter suspended into the depth.. A celenium photocell mounted in the box receives the light through the opal glass inserted into the window of the upper side of the instrument.

Measurement at sea was made by M. Fukuda and S. Katsuki.

Figures in the table represent the amount of radiation in percentage of the value obtained in the air on the deck.

Table 35. Data on submarine illumination in 1956 cruise to the Bering Sea

No. of station	Depth (m)								Additional measurement	
	0*	2	5	10	20	30	40	50		
Os 1	100	62.0	48.0	27.0	9.0	5.4				
Os 2	100	55.3	35.3	19.5	6.0				25m	3.8
Os 3	100	28.0	23.5	18.8	11.3	6.0			35m	3.6
Os 4	100	43.0	32.8	26.3	11.0	4.5	2.1			
Os 7	100	52.0	29.6	20.7	7.8	2.7				
Os 8	100	15.1	11.8	9.8	5.7	2.7			35m	1.9
Os 10	100	20.7	14.1	9.7	4.6	2.0			38m	0.6
Os 11	100	28.7	17.0	14.5	9.0	2.5				
Os 12	100	40.0	30.0	24.0	10.3	5.1	2.0	1.0		
Os 14	100	24.5	22.5	16.3	9.0	4.2	1.7		45m	1.0
Os 15	100	32.4	25.1	19.4	9.2	3.4	1.5		46m	0.8
Os 17	100	34.0	25.8	16.5	6.8	3.2	1.7			
Os 18	100	62.5	46.0	28.5	12.0				29m	3.7
Os 19	100	33.2	28.5	22.8	13.3	5.2			35m	3.7
Os 20	100	35.0	29.0	20.0	10.0	3.2	1.1			
Os 21	100	56.0	38.0	22.2	7.5	3.8			35m	1.8
Os 22	100	47.0	24.8	18.0	5.8	1.9	0.7			
Os 23	100	26.8	15.6	10.8	4.0	1.6				
Os 24	100	43.5	33.2	22.0	6.0	1.9	1.1			
Os 25	100	26.5	17.0	14.0	8.2	3.5	1.5	0.7	55m	0.5
Os 26	100	65.0	49.5	35.5	12.3	4.8			35m	2.0
Os 27	100	18.4	12.5	11.2	5.6	2.9	0.5			
Os 29	100	41.2	32.0	24.8	16.0	7.9	3.3			
Os 30	100	37.0	30.5	26.0	15.5	7.6			37m	1.3
Os 32	100	50.0	40.0	31.0	25.5	8.0				
Os 33	100	30.3	21.4	14.0	3.1	0.3				
Os 34	100	23.5	17.5	10.0	3.5	0.6			35m	0.3
Os 35	100	17.8	13.2	7.5	4.2	0.8	0.2			
Os 36	100	27.6	23.0	17.6	7.6	0.6			35m	0.2
Os 37	100	42.0	29.2	22.0	14.5	0.9				
Os 38	100	32.0	21.0	12.8	5.3	0.9				
Os 39	100	42.3	28.8	11.6	1.7				25m	0.8
Os 40	100	22.5	14.0	10.4	3.8	1.3	0.4	0.2		
Os 42	100	35.2	24.3	17.0	7.4	3.2	1.4	0.6		
Os 43	100	33.0	26.0	13.7	6.8	3.6	1.5	0.7		
Os 48	100	47.3	36.5	27.0	11.7	5.0	2.2			

* radiation measured on the deck

10. Data on Light Absorption Coefficient of Sea Water in Situ
(現場海水の光吸収度測定記録)

The instrument and method of measurement are same as in 1955 cruise.

The measurement was made by M. Fukuda.

Figures in the table represent the absorption coefficient per metre for the present instrument.

Table 36. Data on light absorption of water in 1956 cruise to the Bering Sea

Depth (m)	Os 1	Os 2	Os 3	Os 4	Os 5	Os 6	Os 7	Os 8	Os 9	Os 10	Os 11	Os 12
0						0.42	0.45	0.45		0.41	0.40	0.30
5	0.44	0.35	0.24	0.35	0.40				0.16			
10	0.40	0.33	0.25	0.34	0.44	0.40	0.45	0.45	0.17	0.38	0.39	0.30
20	0.33	0.20	0.24	0.29	0.40	0.36	0.40	0.41	0.18	0.33	0.35	0.32
30	0.14	0.18	0.24	0.32	0.36	0.38	0.40	0.38	0.20	0.30	0.38	0.30
40	0.16	0.14	0.24	0.35	0.33	0.32	0.24	0.35	0.04	0.30	0.36	0.29
50	0.22	0.13	0.22	0.30	0.31	0.27	0.20	0.32	0.01	0.22	0.30	0.26
60	0.22	0.10	0.19	0.27	0.30	0.25	0.19	0.29	0.02	0.22	0.34	0.23
70	0.24	0.09	0.16	0.26	0.26	0.21	0.16	0.30	0.03	0.22	0.31	0.19
80	0.24	0.08	0.22	0.24	0.27	0.28	0.15	0.29	0.10	0.22	0.31	0.18
90	0.25	0.08	0.24	0.22	0.27	0.30	0.13	0.32	0.15	0.22	0.30	0.18
100			0.24	0.23	0.26	0.32	0.13	0.45	0.19	0.22		0.18
110			0.24	0.23	0.27		0.16	0.45	0.26	0.20		0.16
120			0.22	0.24			0.15	0.44	0.30	0.23		0.16
130			0.23	0.27			0.14		0.30	0.24		
140			0.24							0.26		

1) 32m 0.10, 34m 0.20, 35m 0.12

Depth (m)	Os 13	Os 14	Os 15	Os 16	Os 17	Os 18	Os 19	Os 21	Os 22	Os 23	Os 24	Os 25
0	0.36	0.36	0.36	0.33	0.31	0.25	0.16	0.36	0.39	0.47	0.36	0.25
10	0.38	0.35	0.38	0.32	0.30	0.25	0.20	0.35	0.39	0.48	0.35	0.27
20	0.40	0.30	0.40	0.30	0.27	0.26	0.24	0.36	0.34	0.42	0.30	0.35
30	0.38	0.25	0.32	0.29	0.24	0.23	0.22	0.16	0.19	0.22	0.11	0.30
40	0.30	0.21	0.26	0.29	0.20	0.22	0.18	0.07	0.12	0.15	0.11	0.20
50	0.25	0.17	0.22	0.24	0.20	0.25		0.05	0.11	0.15	0.12	0.17
60	0.23	0.13	0.20	0.24	0.17	0.23		0.04	0.09	0.15	0.12	0.15
70	0.19	0.14	0.20	0.20	0.14	0.22		0.02	0.09	0.16	0.12	0.17
80	0.20	0.14	0.20	0.21	0.15			0.02	0.08	0.29	0.13	0.18
90	0.19	0.14	0.20	0.22	0.16			0.02	0.06	0.29	0.13	0.20
100	0.20	0.12	0.20	0.22	0.16			0.03	0.06		0.12	0.19
110	0.19	0.16	0.20	0.20	0.16			0.03	0.07		0.12	0.20
120	0.17	0.16	0.20	0.21	0.17			0.02	0.08		0.12	0.22
130	0.17	0.16	0.20	0.21				0.02			0.12	0.26
140	0.18	0.15	0.20	0.22				0.02			0.14	0.31
150	0.21	0.15	0.20	0.23				0.03				

Table 36. (Continued)

Depth (m)	Os 26	Os 27	Os 28	Os 29	Os 30	Os 31	Os 32	Os 34	Os 35	Os 36	Os 37	Os 38
0	0.09	0.07	0.09	0.07	0.48	0.22	0.28	0.55	0.38	0.42	0.08	0.24
5												
10	0.11	0.08	0.09	0.06	0.47	0.22	0.29	0.58	0.45	0.42[7]	0.08	0.24
20	0.17	0.08	0.10	0.08	0.52	0.25	0.68	0.68	0.46	1.20	0.09[9]	0.37
30	0.19	0.10[2]	0.08	0.18[3]	0.48	0.94	1.02	0.84[5]	0.76[6]	1.02[8]	0.30	0.17[10]
40	0.23	0.09	0.03	0.18	0.56	0.94			0.82	1.02	0.20	0.17
50	0.12	0.10	0.03	0.47	0.76				1.10	0.91	0.34	0.19
60	0.07	0.10	0.03	0.50	0.84[4]					1.02	0.43	0.25
70	0.05	0.07	0.32							1.10	0.46	0.60
80	0.07	0.02	0.62							1.68	0.50	0.86
90	0.06	0.33										
100	0.08	0.80										
110	0.32											
120	0.37											
130	0.43											
140	0.80											

2) 35m 0.15, 38m 0.22 3) 32m 0.12, 33m 0.27 4) 65m 0.90, 68m 1.10 5) 29m 0.92, 32m 0.94
6) 13m 0.49, 18m 0.44, 37m 0.90 7) 18m 0.46, 21m 1.67, 22mover 1.8, 23m 1.50, 24m 0.78,
25m 0.78, 26m 0.82 8) 35m 1.06 9) 28m 0.12 10) 25m 0.22

Depth (m)	Os 39	Os 40	Os 41	Os 42	Os 43	Os 44	Os 45	Os 46	Os 48	Os 49	Os 50
0	0.36[11]	0.47	0.45	0.37	0.40	0.23	0.16		0.18	0.13	0.14
5											
10	0.46	0.55	0.46	0.39	0.40	0.21	0.16	0.07	0.15	0.20	0.20
20	0.22	0.52	0.40	0.37	0.37	0.10	0.15	0.06	0.18	0.30[12]	0.14[13]
30	0.14	0.46	0.18	0.35	0.36	0.06	0.15	0.04	0.11	0.16	0.03
40	0.08	0.44	0.14	0.31	0.35	0.05	0.16	0.06	0.09	0.10	0.02
50	0.07	0.25	0.13	0.27	0.36	0.04	0.18	0.05	0.05	0.05	0.01
60	0.06	0.18	0.11	0.22	0.35	0.03		0.08	0.03	0.03	0.01
70	0.07	0.16	0.15	0.20	0.35	0.02			0.02	0.02	0.03
80	0.08	0.16	0.15	0.20	0.34	0.01			0.02	0.02	0.03
90	0.08	0.20	0.20	0.20	0.33	0.01			0.02	0.02	0.03
100	0.10	0.26		0.19	0.32	0.02			0.02	0.01	0.04
110	0.11	0.30		0.17	0.30	0.02			0.04	0.02	
120	0.13	0.32		0.18	0.29	0.03			0.05	0.02	
130	0.14	0.32		0.20	0.31	0.02			0.06	0.02	
140	0.15	0.32			0.32				0.06	0.03	
150					0.36					0.06	

11) 8m 0.52, 9m 0.58 12) 19m 0.26, 21m 0.40, 22m 0.28, 25m 0.20 13) 12m 0.30, 13m 0.38,
15m 0.30

11. Data on Radio-Activity of Sea Water
(海 水 放 射 能 記 録)

A litre of water was dipped from the sea surface at each of 15 hydrographic stations, and brought to the laboratory. The samples were subjected to measurement under the same method as used in the previous year (Inoue & Fukuda, 1956, Bull. Fac. Fish., Hokkaido Univ. Vol. 7, No.3) by N. Inoue and M. Fukuda on September 12. The efficiency of the G-M counter used is kept at 2×10^{-8} mμc/cpm.

Table 37. Data on radio-activity of sea water in 1956 cruise to the Bering Sea

No. of station	Radio-activity (cpm/l)
Os 1	1.2
Os 4	− 0.6
Os 10	− 2.6
Os 14	3.8
Os 20	− 2.4
Os 22	4.3
Os 25	− 1.3
Os 27	− 5.1
Os 30	0.2
Os 34	2.5
Os 38	4.7
Os 40	− 1.3
Os 42	− 2.0
Os 45	.0.9
Os 49	− 0.1

Back-scatterings are 35.4 ± 2.2

12. Data on Displacement Volume and Weight of Plankton Samples Collected with 45 cm Standard Net
(45cm標準ネット採集によるプランクトン排水量及重量記録)

North Pacific Standard Net, 45 cm × 180 cm, conical, made of nylon gauze, having approximately 0.33 mm mesh aperture, was hauled from about 150 metre depth to the surface unless the sea bottom was shallower than this depth. A flow-meter was mounted at the center of the mouth ring of the net to register the amount of water filtered by the net.

One haul was made at each hydrographic station.

Mesurement of wet displacement volume was made with aspiration filtering apparatus, and wet weight was measured on the samples retained on the filter disc of this apparatus.

The data are represented by calculating the amount of water filtered according to the flow-meter readings, but when the flow-meter readings failed, the data are not corrected by filtration coefficient of net nor variation of hauling distance.

Measurement of volume and weight of the samples was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

Table 38. Plankton volume data (45 cm × 180 cm, GG 54,

Station	Position		Ship's date (1956)		Ship's time	Length of wire run out (m)	Revolutions of flow-meter	Volume of water filtered	Adjusted displacement volume per 1000m³ of water (cc)
Os 1	47-56N	174-51E	July	21	0340	150	1230	22.1	407
Os 2	49-30N	175-00E	〃	〃	2100	150	1290	23.2	776
Os 3	50-19N	175-00E	〃	22	1225	150	1050	18.9	53
Os 4	51-30N	175-00E	〃	23	0650	150	1440	25.9	77
Os 5	52-30N	175-00E	〃	〃	1420	150	1550	27.9	107
Os 6	53-50N	174-57E	〃	24	1020	150	2510	45.2	398
Os 7	55-00N	175-00E	〃	〃	1920	150	2110	38.0	79
Os 8	55-00N	177-10E	〃	25	1330	150	1000	18.0	389
Os 9	55-00N	179-20E	〃	〃	2318	150	1190	21.4	747
Os 10	55-02N	178-26W	〃	26	0923	150	1160	20.9	287
Os 11	53-32N	173-27W	〃	27	0955	150	1100	19.8	303
Os 12	53-40N	179-50W	〃	〃	1740	150	failed	(25.5)	(1454)
Os 13	53-40N	178-54E	〃	28	0015	150	failed	(25.5)	(157)
Os 14	53-42N	177-29E	〃	〃	0710	150	1760	31.7	126
Os 15	52-20N	177-30E	〃	〃	1735	150	1030	18.5	162
Os 16	52-20N	178-50E	〃	29	0035	150	failed	(25.5)	(108)
Os 17	52-21N	179-49W	〃	〃	0700	150	2300	41.4	194
Os 18	50-40N	179-50W	〃	29	1935	150	1330	23.9	543
Os 19	50-24N	178-30W	〃	30	1045	150	1370	24.7	406
Os 20	53-45N	176-20W	〃	31	0850	150	1020	18.4	436
Os 21	55-00N	176-20W	〃	〃	2020	150	1120	20.2	397
Os 22	56-36N	177-17W	Aug.	1	1625	150	1070	19.3	363
Os 23	58-12N	178-16W	〃	2	1510	150	1250	22.5	533
Os 24	59-17N	179-49W	〃	3	0615	150	1500	27.0	185
Os 25	60-45N	179-56W	〃	〃	1430	150	1700	3.6	131
Os 26	61-22N	179-40E	〃	〃	1945	150	1010	19.2	208
Os 27	61-44N	178-28W	〃	4	1245	143	1080	19.4	257
Os 28	62-10N	176-45W	〃	〃	2252	110	790	19.2	703
Os 29	62-33N	174-56W	〃	5	0537	70	failed	(11.1)	(180)
Os 30	63-00N	173-00W	〃	〃	1538	60	410	7.4	136
Os 31	62-38N	171-20W	〃	6	0123	50	410	7.4	372
Os 32	62-15N	169-36W	〃	〃	0820	40	failed	(6.4)	(157)
Os 33	61-21N	168-58W	〃	〃	1610	35	310	5.6	179
Os 34	60-20N	169-00W	〃	7	0640	40	310	5.6	179
Os 35	59-24N	169-33W	〃	8	1540	60	370	6.7	751

North Pacific Standard Net) in 1956 cruise to the Bering Sea

Adjusted wet weight per 1000m³ of water (gr)	Remarks
185	158 *Aglantha* are removed before measurement.
405	28 〃 〃
27	3 〃 〃
62	An 〃 〃
22	2 〃 〃
217	9 〃 〃 ; sample contains many *Eucalanus bungii*
58	
206	Many *Eucalanus bungii*
576	Many *Calanus cristatus*
67	7 *Aglantha* are removed before measurement.
197	
(1328)	Many *Calanus cristatus*
(83)	11 *Aglantha* are removed before measurement.
101	
124	
(79)	An *Aglantha* is removed before measurement.
109	Many *Eucalanus bungii*
439	
313	Many *Calanus plumchrus*
229	An *Aglantha* is removed before measurement; sample contains many *Eucalanus bungii*
213	18 〃 〃
218	6 〃 〃
333	27 〃 〃
99	16 〃 〃
43	
162	Many small-sized copepods
170	
239	A brittle star is removed before measurement.
(117)	
54	A large jellyfish is removed before measurement.
95	
(63)	
548	
90	
631	Many small-sized copepods

Table 38. (Continued)

Station	Position		Ship's date (1956)	Ship's time	Length of wire run out (m)	Revolutions of flow-meter	Volume of water filtered	Adjusted displacement volume per 1000m³ of water (cc)
Os 36	58-30N	170-41W	Aug. 9	0620	80	960	17.28	1100
Os 37								
Os 38	57-30N	172-00W	〃 11	1230	120	1160	20.9	479
Os 39	56-19N	172-01W	〃 12	1510	155	1070	19.3	311
Os 40	55-40N	172-00W	〃 〃	1335	150	1480	26.6	75
Os 41	54-10N	172-00W	〃 13	0031	150	1880	33.8	178
Os 42	53-00N	172-00W	〃 〃	0955	155	1540	27.7	181
Os 43	52-27N	172-00W	〃 〃	1535	151	1040	18.7	53
Os 44	51-50N	172-00W	〃 〃	2045	150	1930	34.7	187
Os 45	51-00N	172-00W	〃 14	1440	150	1410	25.4	906
Os 46	49-45N	172-00W	〃 〃	1550	150	1770	31.9	220
Os 47	48-13N	172-00W	〃 15	1320	150	1730	31.1	257
Os 48	47-38N	167-21W	〃 16	0535	151	1040	18.7	267
Os 49	47-10N	179-25W	〃 〃	2138	150	1550	27.9	215
Os 50	46-07N	175-35E	〃 17	2140	150	1160	20.9	192

Adjusted wet weight per 1000m³ of water (gr)	Remarks
387	Many diatoms
	No sampling
312	Many small-sized copepods
249	
75	5 *Aglantha* are removed before measurement.
59	
152	2 large jellyfish are removed before measurement; sample contains many *Calanus cristatus*.
21	
86	
552	Many *Calanus plumchrus*
160	
164	43 *Aglantha* are removed before measurement.
165	18 *Aglantha* and a large jellyfish are removed before measurement.
125	15 *Aglanthac* are removed before mesurement.
158	

13. Data on Displacement Volume and Weight of Plankton Samples Collected with Fish Larva Net

（稚魚ネット採集によるプランクトン排水量及重量記録）

Fish larva net, 130 cm in mouth diameter and 450 cm in length, was towed at the surface layer at a speed as low as about 2 knots for ten minutes keeping the net exposed to the extent of half of mouth ring above the sea surface. However, because of difficulty in operation this position of the mouth ring was not always kept, and accordingly, there was much inconstancy in amount of water entering the mouth of the net. The net was not provided with flow-meter. The data presented here give only roughly relative abundance of the catches in a tow in various localities (involving difference in catches due to sampling times of day).

Unusual large organisms such as jellyfish were removed from the samples before they were submitted to the measurement of volume and weight.

Fish larvae contained in the samples were also removed before the measurement. The number of fish larvae sampled is given in "15".

Displacement volume of samples was measured with aspiration filtering apparatus. The values represent approximately wet displacement volume.

The weighing of samples was made on the samples retained on the filter of the aspiration filtering apparatus. The values represent wet weight.

Measurement was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

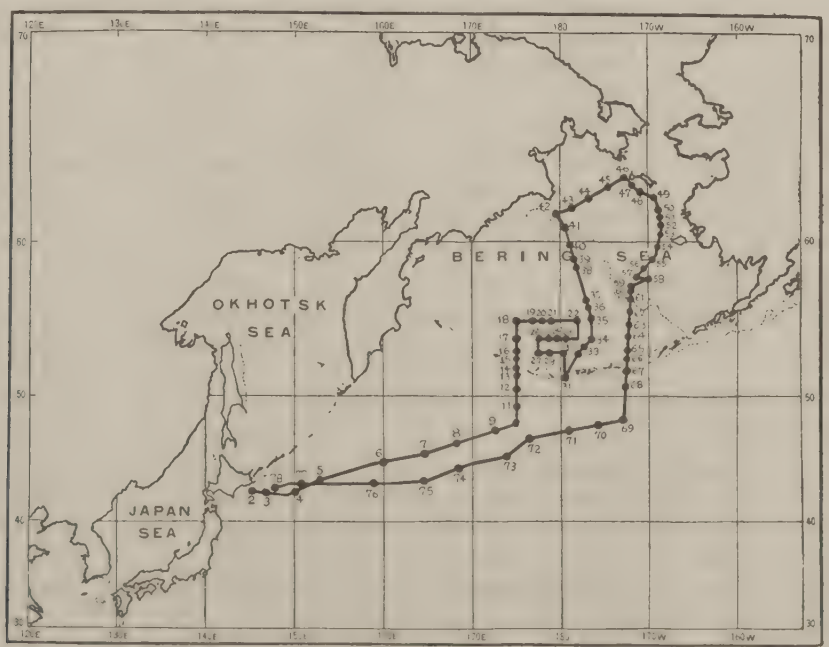

Fig. 18. Stations of fish-larva net tow in 1956 cruise of the "Oshoro Maru"

Table 39. Plankton volume data (fish-larva

No. of station	Corresponding No. of hydrographic station	Position		Ship's date (1956)	Ship's time	Displacement volume of total samples in a tow (cc)
1		42-18N	146-48E	July 11	1842	36.0
2		Kushiro Harbour		13	night	1.0
3		41-59N	145-18E	14	1853	4.0
4		42-53N	150-08E	15	1832 (1851)	172.0
5		43-44N	154-58E	16	1919	10.0
6		44-46N	160-01E	17	1903	400.0
7		45-38N	165-06E	18	1842	37.0
8		46-18N	169-27E	19	1932	161.0
9		47-32N	173-46E	20	1918	40.0
10	Os 1	47-56N	174-51E	21	0703	5.0
11	Os 2	49-30N	175-00E	〃	2205	126.0
12	Os 3	50-19N	175-00E	22	1240	8.0
13		51-11N	175-00E	〃	2037	80.0
14	Os 4	51-30N	175-00E	23	0705	11.0
15	Os 5	52-32N	175-04E	〃	1530	5.0
16		52-58N	175-03E	〃	1855	14.0
17	Os 6	53-50N	174-57E	24	1050	32.0
18	Os 7	55-00N	175-00E	〃	2042	102.0
19	Os 8	55-00N	177-10E	25	1401	1.0
20		55-00N	178-42E	〃	2008	208.0
21	Os 9	55-00N	179-20E	〃	2345	160.0
22	Os10	55-02N	178-26W	26	1102	2.0
23	Os12	53-40N	179-50W	27	1806	14.0
24		53-40N	179-29E	〃	2710	40.0
25	Os13	53-40N	178-54E	28	0046	36.0
26	Os14	53-42N	177-29E	〃	0739	6.0
27	Os15	52-20N	177-30E	〃	1758	12.0
28		52-20N	178-10E	〃	2110	16.0
29	Os16	52-20N	178-50E	29	0101	36.0
30	Os17	50-21N	179-49W	〃	0737	5.0
31	Os18	51-00N	179-54W	〃	2016	64.0
32	Os19	52-24N	178-30W	30	1135	144.0
33		53-19N	177-03W	〃	2003	133.0
34	Os20	53-45N	176-20W	31	1016	18.0
35	Os21	55-00N	176-20W	〃	2252	60.0

net) in 1956 cruise to the Bering Sea

Wet weight of total samples in a tow (gr)	Remarks
34.0	A large jellyfish is removed before measurement. Mainly small-sized copepods
0.5	A large jellyfish and a shrimp are removed before measurement.
1.7	Mainly small-sized copepods
116.8	Exclusively *Calanus plumchrus*
6.9	47 large jellyfish are removed before measurement.
267.2	Exclusively *Calanus plumchrus*
21.5	Many small-sized copepods
141.4	Many small-sized copepods
31.2	200 *Aglantha* are removed before measurement.
4.0	Sample is mainly composed of small-sized copepods. A large jellyfish is removed before measurement.
123.0	41 *Aglantha* are removed before measurement.
4.0	
72.4	Mainly *Calanus plumchrus* and young *Parathemisto*
10.7	Mainly young *Parathemisto*
1.5	Containing abundant diatoms
12.0	Mainly young *Parathemisto*
16.0	Exclusively diatoms
99.0	
0.5	
164.0	
110.4	
1.8	
13.3	Two large jellyfish are removed before measurement.
14.6	
33.3	
2.3	1080 *Aglantha* and 36 large jellyfish are removed before measurement.
4.4	Many diatoms and large number of *Calanus plumchrus*
10.4	Many diatoms
29.7	270 *Aglantha* and 18 large jellyfish are removed before measurement.
2.7	Exclusively diatoms
40.8	Many diatoms and large number of young *Parathemisto*
131.6	Mainly *Calanus plumchrus* and young *Parathemisto*
83.2	195 large jellyfish are removed before measurement.
9.4	
52.1	429 large jellyfish are removed before measurement.

Table 39. (Continued)

No. of station	Corresponding No. of hydrographic station	Position		Ship's date (1956)	Ship's time	Displacement volume of total samples in a tow (cc)
36	Os22	56-35N	177-18W	Aug. 1	1732	8.0
37		56-47N	177-24W	〃	2035	50.0
38	Os23	58-12N	178-16W	2	1720	100.0
39		58-41N	178-28W	〃	2123	192.0
40	Os24	59-47N	179-17W	3	0650	30.0
41	Os25	60-45N	179-56W	〃	1456	2.0
42	Os26	61-22N	179-40E	〃	2106	4.0
43	Os27	61-44N	178-28W	4	1603	1.5
44	Os28	62-10N	176-45W	〃	2227	8.0
45	Os29	62-33N	174-56W	5	0556	2.0
46	Os30	63-03N	172-54W	〃	1612	3.5
47		62-57N	172-15W	〃	2115	7.5
48	Os31	62-38N	171-20W	6	0145	2.0
49	Os32	62-15N	169-36W	〃	0827	2.0
50	Os33	61-26N	168-58W	〃	1633	4.0
51		61-30N	168-32W	〃	2208	22.0
52	Os34	60-20N	169-00W	7	0655	18.0
53		61-09N	168-25W	〃	2117	62.5
54	Os35	59-24N	169-33W	8	1500	7.0
55		59-17N	169-10W	〃	2116	95.0
56	Os36	58-30N	170-41W	9	0650	28.0
57		58-36N	170-18W	〃	2028	48.0
58		58-30N	169-33W	10	2023	60.0
59	Os38	57-30N	172-00W	11	1250	2.0
60		57-31N	171-34W	〃	2024	48.0
61	Os39	56-19N	172-01W	12	0622	18.0
62	Os40	55-21N	172-00W	〃	1537	5.0
63		54-42N	171-57W	〃	2010	16.0
64	Os41	54-10N	172-00W	13	0205	24.0
65	Os42	53-00N	172-00W	〃	1020	6.0
66	Os43	52-27N	172-00W	〃	1609	2.0
67	Os44	51-50N	172-00W	〃	2210	70.0
68	Os45	51-00N	172-00W	14	0508	2.0
69		47-52N	174-29W	15	1939	8.0
70	Os48	47-38N	176-21W	16	0632	16.0

Wet weight of total samples in a tow (gr)	Remarks
6.4	Many *Sagitta*
33.0	Many *Sagitta*
91.0	
147.2	
23.4	
1.5	
3.3	
0.9	
6.8	
1.1	
1.1	Mainly small-sized copepods
5.1	Mainly composed of small-sized copepods and *Parathemisto*
0.8	142 *Aglantha* are removed before measurement.
0.3	Many small-sized copepods
3.5	Abundant small-sized copepods
6.0	Many diatoms and small-sized copepods
15.8	Abundant *Calanus plumchrus*
52.5	Mainly composed of small-sized copepods and *Sagitta*
5.8	Exclusively diatoms
87.5	
21.0	Exclusively diatoms
39.0	Many diatoms and *Calanus plumchrus*
55.0	Abundant *Calanus plumchrus*
1.3	Two large jellyfish are removed before measurement.
37.2	Three large jellyfish are removed before measurement. Sample contains many *Calanus plumchrus*
17.0	Many *Parathemisto* and small-sized copepods
3.6	Exclusively diatoms
12.0	15 jellyfish are removed berore measurement.
22.8	Many diatoms
4.6	
1.1	
51.5	Mainly composed of *Calanus plumchrus* and *Calanus cristatus*
0.2	Abundant small-sized copepods
3.2	1144 *Aglantha* are removed before measurement.
14.3	

Table 39. (Continued)

No. of station	Corresponding No. of hydrographic station	Position		Ship's date (1956)	Ship's time	Displacement volume of total samples in a tow (cc)
71	Os49	47-10N	179-35W	16	2103	32.0
72	Os50	46-10N	175-31E	17	2110	84.0
73		45-07N	171-48E	18	1836	5.0
74		44-05N	168-20E	19	1851	48.0
75		43-00N	163-31E	20	1810	12.5
76		43-00N	158-27E	21	1830	1.0
77		43-06N	153-31E	22	1848	16.0
78		43-03N	148-25E	23	1808	24.0

Wet weight of total samples in a tow (gr)	Remarks
14.5	
43.4	40 *Aglantha* are removed before measurement.
3.6	
43.8	
9.5	Two large jallyfish are removed before measurement; sample is composed of exclusively diatoms.
0.4	A large jellyfish is removed before measurement.
9.2	
21.6	

14. Data on Fish Larvae Collected with Fish Larva Net
(稚魚ネット採集による稚魚記録)

Fish larva net, 130 cm in mouth diameter and 450 cm in length, was towed at the surface layer at a speed as low as about 2 knots for ten minutes keeping the net exposed to the extent of half of mouth ring above the sea surface.

Identification of fish larvae was made by S. Sato and K. Kobayashi.

Table 40. Data on collection of fish larvae in 1956 cruise to the Bering Sea

No. of collection	Hydrographic station	Position	Ship's date	Ship's time	Fish-larva collected (Species or group)	Number of individuals
1		42°-18′N 146°-48′E	July 11	1842	No fish-larva	
2			13			
3		41°-59′N 145°-18′E	14	1853	No fish-larva	
4		42°-53′N 150°-08′E	15	1832	No fish-larva	
5		43°-44′N 154°-58′E	16	1919	*Psenus cyanophrys* VALENCIENNES	1
					Unidentified (d)	3
6		44°-46′N 160°-01′E	17	1903	No fish-larva	
7		45°-38′N 165°-06′E	18	1842	No fish-larva	
8		46°-18′N 169°-27′E	19	1932	No fish-larva	
9		47°-32′N 173°-46′E	20	1918	Pholidae	1
10	Os 1	47°-56′N 174°-51′E	21	0703	No fish-larva	
11	Os 2	49°-30′N 175°-00′E	〃	2205	Pholidae	210
					Hexagrammos decagrammus (PALLAS)	5
12	Os 3	50°-19′N 175°-00′E	22	1240	Pholidae	43
					Hexagrammos decagrammus (PALLAS)	1
13		51°-10′N 175°-00′E	〃	2037	Pholidae	62
					Anoplopoma fimbria (PALLAS)	2
					Hexagrammos decagrammus (PALLAS)	3
					Hemilepidotus	2
					Liparis (c)	1
					Unidentified (a)	1
14	Os 4	51°-30′N 175°-00′E	23	0705	Pholidae	2
					Hexagrammos decagrammus (PALLAS)	1
15	Os 5	52°-32′N 175°-04′E	〃	1530	*Hexagrammos decagrammus* (PALLAS)	3
					Fish eggs (b)	19
16		52°-58′N 175°-03′E	〃	1855	Pholidae	5
					Hexagrammos decagrammus (PALLAS)	1
17	Os 6	53°-50′N 174°-57′E	24	1050	Pholidae	3
					Fish egg (a)	1
18	Os 7	55°-00′N 175°-00′E	〃	2042	*Ammodytes hexapterus* (PALLAS)	2

Table 40. (Continued)

No. of collection	Hydrographic station	Position	Ship's date	Ship's time	Fish-larva collected (Species or group)	Number of individuals
					Pholidae	57
					Hemilepidotus	3
					Unidentified (a)	4
19	Os 8	55°-00′N 177°-10′E	July 25	1401	Pholidae	3
20		55°-00′N 178°-42′E	〃	2008	Pholidae	1
					Hemilepidotus	2
					Unidentified (a)	1
21	Os 9	55°-00′N 179°-20′E	〃	2345	Pholidae	105
22	Os 10	55°-02′N 178°-26′W	26	1102	Pholidae	7
23	Os 12	53°-40′N 179°-50′W	27	1806	*Hexagrammos decagrammus* (PALLAS)	1
					Fish eggs (b)	51
24		53°-40′N 179°-29′E	〃	2110	Pholidae	131
					Unidentified (a)	135
25	Os 13	53°-40′N 178°-54′E	28	0046	Pholidae	60
					Theragra chalcogramma (PALLAS)	1
					Unidentified (a)	38
26	Os 14	53°-42′N 177°-29′E	〃	0739	Pholidae	4
					Unidentified (a)	3
27	Os 15	52°-20′N 177°-30′E	〃	1758	Pholidae	1
					Unidentified (a)	1
28		52°-20′N 178°-10′E	〃	2110	Pholidae	72
					Anoplopoma fimbria (PALLAS)	1
					Hexagrammos decagrammus (PALLAS)	5
29	Os 16	52°-20′N 178°-50′E	29	0101	Pholidae	55
					Hexagrammos decagrammus (PALLAS)	1
					Theragra chalcogramma (PALLAS)	2
					Unidentified (a)	1
30	Os 17	52°-21′N 179°-49′W	〃	0737	Pholidae	7
31	Os 18	51°-00′N 179°-54′W	〃	2016	*Ammodytes hexapterus* (PALLAS)	15
					Pholidae	46
					Hemilepidotus	5
					Unidentified (a)	1
32	Os 19	52°-24′N 178°-30′W	30	1135	*Ammodytes hexapterus* (PALLAS)	1
					Pholidae	2
					Hexagrammos decagrammus (PALLAS)	1
					Hemilepidotus	1
33		53°-19′N 177°-03′W	〃	2003	*Lumpenus*	3
					Pholidae	74
					Hexagrammos decagrammus (PALLAS)	1
					Hemilepidotus	1

Table 40. (Continued)

No. of collection	Hydrographic station	Position	Ship's date	Ship's time	Fish-larva collected (Species or group)	Number of individuals
					Unidentified (a)	1
					Unidentified (b)	2
34	Os 20	53°-45′N 176°-20′W	31	1016	Pholidae	8
35	Os 21	55°-00′N 176°-20′W	〃	2252	Pholidae	42
					Anoplopoma fimbria (PALLAS)	2
36	Os 22	56°-35′N 177°-18′W	Aug. 1	1732	Pholidae	7
					Hexagrammos decagrammus (PALLAS)	2
37		56°-47′N 177°-24′W	〃	2035	Pholidae	3
38	Os 23	58°-12′N 178°-16′W	2	1720	No fish-larva	
39		58°-41′N 178°-28′W	〃	2123	*Lumpenus*	1
					Hemilepidotus	1
					Theragra chalcogramma (PALLAS)	2
40	Os 24	59°-47′N 179°-17′W	3	0650	No fish-larva	
41	Os 25	60°-45′N 179°-56′W	〃	1456	No fish-larva	
42	Os 26	61°-22′N 179°-40′E	〃	2106	No fish-larva	
43	Os 27	61°-44′N 178°-28′W	4	1603	No fish-larva	
44	Os 28	62°-10′N 176°-45′W	〃	2227	*Hexagrammos stelleri* (TILESIUS)	1
					Hemilepidotus	1
45	Os 29	62°-33′N 174°-56′W	5	0556	No fish-larva	
46	Os 30	63°-03′N 172°-54′W	〃	1612	No fish-larva	
47		62°-57′N 172°-15′W	〃	2115	*Stichaeus punctatus* (FABRICIUS)?	131
					Myoxocephalus (a)	31
					Liparis (a)	3
48	Os 31	62°-38′N 171°-20′W	6	0145	*Ammodytes hexapterus* (PALLAS)	24
					Stichaeus punctatus (FABRICIUS)?	50
					Stichaeus	1
					Myoxocephalus (a)	18
49	Os 32	62°-15′N 169°-36′W	〃	0827	No fish-larva	
50	Os 33	61°-26′N 168°-58′W	〃	1633	No fish-larva	
51		61°-30′N 168°-32′W	〃	2208	No fish-larva	
52	Os 34	60°-20′N 169°-00′W	7	0655	Osmeridae	1
					Myoxocephalus (b)	2
					Myoxocephalus (c)	1
53		61°-09′N 168°-25′W	〃	2117	*Myoxocephalus* (c)	1
					Podothecus acipenserinus (TILESIUS)	1
					Liparis (b)	9
					Unidentified (e)	6
54	Os 35	59°-24′N 169°-33′W	8	1500	No fish-larva	
55		59°-17′N 169°-10′W	〃	2116	Osmeridae	2
					Liparis (a)	12

Table 40. (Continued)

No. of collection	Hydrographic station	Position	Ship's date	Ship's time	Fish-larva collected (Species or group)	Number of individuals
56	Os 36	58°-30′ N 170°-41′ W	9	0650	No fish-larva	
57		58°-36′ N 170°-18′ W	〃	2028	Osmeridae	1
58		58°-30′ N 169°-33′ W	10	2023	Osmeridae	1
59	Os 38	57°-30′ N 172°-00′ W	11	1250	No fish-larva	
60		57°-31′ N 171°-34′ W	〃	2024	No fish-larva	
61	Os 39	56°-19′ N 172°-01′ W	12	0622	*Hemilepidotus*	1
62	Os 40	55°-21′ N 172°-00′ W	〃	1537	No fish-larva	
63		54°-42′ N 171°-57′ W	〃	2010	No fish-larva	
64	Os 41	54°-10′ N 172°-00′ W	13	0205	*Lampanyctus*	1
					Pholidae	59
65	Os 42	53°-00′ N 172°-00′ W	〃	1020	No fish-larva	
66	Os 43	52°-27′ N 172°-00′ W	〃	1609	Pholidae	1
					Anoplopoma fimbria (PALLAS)	1
					Fish eggs	54
67	Os 44	51°-50′ N 172°-00′ W	〃	2210	*Ammodytes hexapterus* (PALLAS)	48
					Pholidae	5
					Aptocyclus	1
68	Os 45	51°-00′ N 172°-00′ W	14	0508	Pholidae	1
69		47°-52′ N 174°-29′ W	15	1939	*Tarletonbeania*	1
					Pholidae	2
					Unidentified (c)	1
70	Os 48	47°-38′ N 176°-21′ W	16	0632	No fish-larva	
71	Os 49	47°-10′ N 179°-35′ W	〃	2103	No fish-larva	
72	Os 50	46°-10′ N 175°-31′ E	17	2110	No fish-larva	
73		45°-06′ N 171°-48′ E	18	1836	No fish-larva	
74		44°-05′ N 168°-20′ E	19	1851	No fish-larva	
75		43°-00′ N 163°-30′ E	20	1810	No fish-larva	
76		43°-00′ N 158°-27′ E	21	1830	No fish-larva	
77		43°-06′ N 153°-31′ E	22	1848	No fish-larva	
78		43°-03′ N 148°-25′ E	23	1808	No fish-larva	

15. Data on Salmon Gill-Net Fishing
(鮭鱒流網試験記録)

Four sorts of net having different mesh size were used.

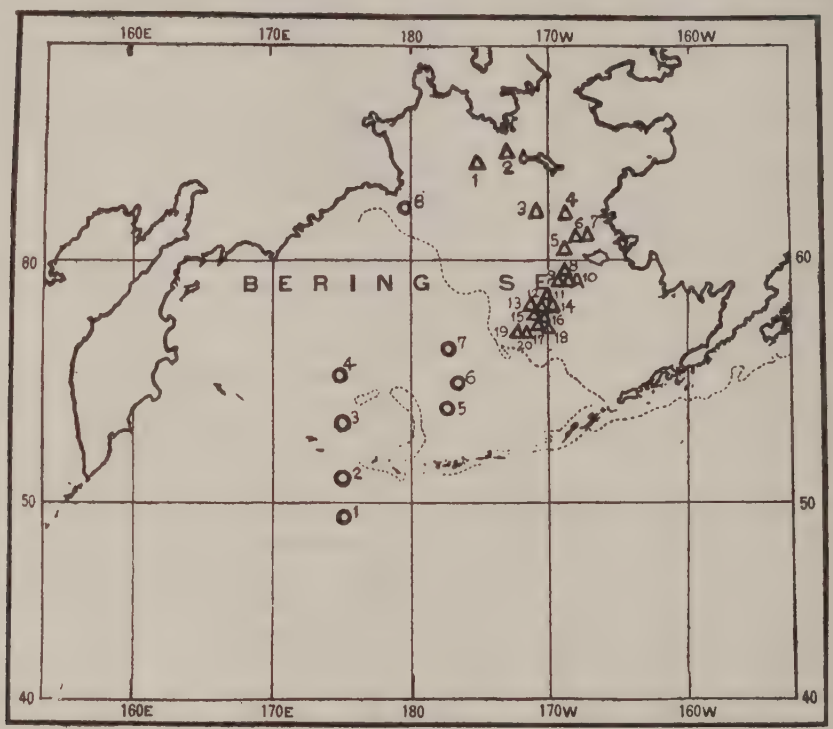

Fig. 19. Location of salmon gill-net set (○) and trawling (△) in 1956 cruise of the "Oshoro Maru"

Table 41. Data on salmon fishing operation in 1956 cruise to the Bering Sea

No. of fishing	Date and time (zone time)				Dosition of net-set		Direction of drift "toward"	Weather
	Net set		Net haul					
	Date	Time	Date	Time	Lat.	Long.		
1	7-21	1823	7-22	0410	49-30 N	175-00 E	190°	o
2	7-22	1900	7-23	0350	51-10.7N	175-00 E	135~140	o
3	7-23	1920	7-24	0423	52-58 N	175-03 E	035	f
4	7-24	2005	7-25	0352	55-00 N	175-00 E	350~000	o
5	7-30	1935	7-31	0424	53-19 N	177-03W	030	r
6	7-31	1930	8- 1	0426	55-00 N	176-20W	270~300	o
7	8- 1	1935	8- 2	0355	56-47 N	177-22W	145	o
8	8- 3	2035	8- 4	0434	61-22 N	179-40W	120	f

No. of fishing	Wind		Surface temp. (C°)	Colour of sea	Trans-parency (m)	Amount of net cast (Tan) (1 Tan=492m long, 5.3—5.4m deep)			
	Direction	Force				* Mesh 3.5 Sun (10.6cm)	Mesh 3.8 Sun (11.5cm)	Mesh 4.0 Sun (12.1cm)	Mesh 4.5 Sun (13.6cm)
1	WNW	2	8.7	×	11	5	0	20	5
2	W	2	7.4	3	17	5	0	20	5
3	SW	2	7.7	4	13	5	9	21	5
4	SE	4	7.7	5	10	5	9	20	5
5	SSE	3	9.1	5	10	5	9	20	5
6	NE	3	8.7	4	9.5	5	9	20	5
7	W	2	8.9	5	10	5	8	19	5
8	SW	1	8.8	4	18	5	18	15	5

* Mesh size: Length of mesh when stretched.

Table 42. Data on catch of salmon in 1956 cruise to the Bering Sea

No. of fishing	Nnmber of fish caught									
	Mesh size of net 3.5 Sun					Mesh size of net 3.8 Sun				
	Sockeye (ベニ)	Chum (シロ)	Pink (マス)	King (マスノスケ)	Silver (ギン)	Sockeye (ベニ)	Chum (シロ)	Piuk (マス)	King (マスノスケ)	Silver (ギン)
1	13	0	0	0	0	9	0	1	1	0
2	36	0	0	0	1	7	0	0	0	0
3	1	2	0	0	0	1	0	0	0	0
4	2	11	0	0	0	0	1	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	2	0	0	0	0	0	0	0	0	0
7	0	4	0	0	0	0	0	0	0	0
8	0	1	0	0	0	0	0	0	0	0

No. of fishing	Nnmber of fish caught									
	Mesh size of net 4.0 Sun					Mesh size of net 4.5 Sun				
	Sockeye (ベニ)	Chum (シロ)	Pink (マス)	King (マスノスケ)	Silver (ギン)	Sockeye (ベニ)	Chum (シロ)	Pink (マス)	King (マスノスケ)	Silver (ギン)
1	4	6	1	1	14	0	1	0	0	14
2	82	2	1	0	14	6	0	0	0	8
3	10	20	2	0	0	1	0	0	0	2
4	9	9	0	0	1	2	2	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	1	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	1	0	0	0	0	0	0	0	0

16. Data on Measurement of Biological Characters of Salmon
(鮭鱒生物学的測定記録)

Measurement was made by M. Ueno, K. Kyushin, T. Kinoshita, M. Oseko and T. Sasaki.

I. Measurement of various biological characters
(各種生物学的形質測定)

It was impossible to sample a definite number of specimens from each net of different mesh size. The sampling was made at random from mixed catch.

Age determination was made by T. Kubo.

Abbreviations:

Sex, F.	Female
M.	Male
F. L.	Fork length
B. L.	Scaled body length
B. H.	Body height
S-E.	Distance from eye center to tip of snout
C. P. D.	Caudal peduncle depth
B. W.	Body weight
G. W.	Gonad weight
E. N.	Egg number in ovary
E. D.	Mean egg diameter (measured 30 eggs)
P. A. N.	Pyrolic appendage number
Age, Fn.	Number of annuli on sclae formed in fresh-water life
Sn.	Number of annuli on scale formed in salt water life
S. P.	Scale pattern (see p. 117)

Table 43. Data on measurement of salmon in 1956 cruise to the Bering Sea

1. Silver salmon, ギンザケ

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age
1	F	618	570	167	40	44	3300	157	5060	3.7	80	
	F	610	565	172	44	42	3320	224	6300	4.9		
	F	606	566	171	36	47	3490	180	2830	3.7	77	
	F	600	558	164	39	48	3240	152	4260	4.0	61	
	F	586	544	162	36	44	2900	171	5350	3.9	67	
	F	554	522	149	33	43	2280	42	5070	2.5	70	
	F	542	505	147	41	43	2320	65	2290	1.7	70	
	F	536	506	146	37	42	2280	53	6200	2.5	55	
	F	613	570	164	40	48	3170					
	F	592	554	168	40	44	3200					
	F	590	552	172	36	45	3300					
	F	579	538	152	37	42	2620					
	F	573	536	165	37	46	3080					
	F	570	532	163	37	45	3120					
	M	643	604	180	50	48	3480	124			54	
	M	608	564	167	43	44	3240	84			65	
	M	589	552	155	41	44	2700	16			82	
	M	655	610	184	50	50	4200					
	M	598	556	155	51	48	2900					
	M	552	514	143	44	44	1980					
	M	545	507	139	37	40	2180					
		606	565	178	48	46	3380					
		590	554	153	39	44	2680					
		583	543	168	51	48	3200					
		546	515	161	34	42	2750					
2	F	628	589	160	44	47	3180	111	6270	3.2	77	
	F	612	570	184	40	44	2420	64	3850	3.0	59	
	F	612	571	163	41	47	2980	69	8700	2.5	76	
	F	606	565	158	41	47	3050	141	5740	3.5	63	
	F	580	544	147	34	44	2900	152	5470	3.4	71	
	F	574	534	152	35	46	2820	121	4030	3.6	67	
	F	562	522	152	33	41	2620	104	6520	3.2	79	
	F	620	576	151	42	46	3180					
	F	607	570	170	42	49	3470					
	F	606	565	144		43	2600					
	F	536	501	126	36	40	1910					
	M	630	587	183	49	52	4050	98			70	
	M	556	514	137	40	41	2280	112			77	
	M	542	506	130	37	40	2050	90			61	
	M	603	561	157	45	46	3020					
	M	593	552	164	42	48	3500					

Table 43. (Continued)

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age
2	M	572	530	145	42	44	2480					
	M	563	526	150	40	44	2520					
	M	560	521	150	42	45	2480					
	M	522	488	131	36	40	2900					
		526	490	142	38	42	2120					

Table 43. (Continued)

2. Sockeye salmon, ベニザケ

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age
1	F	603	571	153	38	42	2950	43	4220	2.6	111	F_2 S_3
	F	510	482	134	30	38	1850	71	4220	3.1	79	F_1 S_2
	F	494	467	132	26	37	1500	7	7420	1.3	90	F_1 S_2
	F	454	429	108	25	33	1100	6	6200	1.1	98	F_2 S_2
	F	445	416	106	25	34	1000	7	4200	1.3	112	F_2 S_2
	F	441	417	101	24	33	920	7	7420	1.3	92	F_2 S_2
	F	436	411	97	25	33	920	5	6410	1.0	100	F_1 S_2
	F	554	520	150	33	42	2360					F_2 S_2
	F	475	449	109	26	34	1210					F_2 S_2
	F	462	447	106	27	34	1110					F_2 S_2
	F	458	434	101	23	34	1050					F_1 S_2
	M	516	486	130	29	38	1600				102	F_2 S_2
	M	492	467	126	32	37	1450				91	F_2 S_2
	M	460	430	113	27	35	1150				84	F_1 S_2
	M	454	426	114	25	34	1100				83	F_1 S_2
	M	483	457	117	32	36	1370					F_1 S_2
	M	443	420	100	30	33	950					F_2 S_2
2	F	500	466	120	28	38	1420	8	3270	—	85	F_1 S_2
	F	492	462	118	27	38	1440	5	4860	1.3	104	F_1 S_2
	F	484	461	123	26	35	1450	8	7030	1.3	109	F_1 S_2
	F	464	436	118	27	35	1240	7	5530	1.2	90	F_2 S_2
	F	462	433	112	26	34	1180	10	5120	1.4	93	F_1 S_2
	F	453	426	112	25	36	1200	6	5120	1.2	80	F_1 S_2
	F	450	420	106	25	34	1050	6	4950	1.3	80	
	F		482				1630					F_2 S_2
	F		463				1380					F_2 S_2
	F		453				1420					F_1 S_2
	F		450				1440					
	F		450				1280					
	F		443				1250					F_1 S_2
	F		440				1150					F_1 S_2

Table 43. (Continued)

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age
2	F		439				1230					
	F		439				1360					F_2 S_2
	F		432				1180					F_1 S_2
	F		429				1050					F_2 S_2
	F		426				1180					F_1 S_2
	F		424				1160					F_1 S_2
	F		420				1110					F_1 S_2
	M	574	504	119	28	34	1470	3			96	F_1 S_2
	M	560	527	144	38	42	2260	6			83	F_2 S_2
	M	540	507	145	34	42	2050	3			86	F_1 S_3
	M	538	506	134	35	41	1940	4			88	
	M	533	500	144	39	40	2100	17			89	F_1 S_2
	M	528	495	137	28	38	1880	1			87	F_2 S_2
	M	502	470	123	27	36	1610	3			101	F_2 S_2
	M	521	490	124	29	36	1450				99	F_2 S_2
	M	508	480	132	31	39	1720				93	F_2 S_2
	M	502	474	131	35	36	1670				89	F_2 S_2
	M	498	465	116	28	35	1290				87	F_1 S_2
	M	475	443	115	26	34	1230				97	F_1 S_2
	M	474	446	124	28	34	1350				125	F_1 S_2
	M		489				2470					F_2 S_2
	M		472				1670					F_1 S_2
	M		470				1460					F_2 S_2
	M		466				1530					F_1 S_2
	M		462				1660					
	M		460				1740					F_2 S_2
	M		460				1490					F_1 S_2
	M		459				1420					F_1 S_2
	M		457				1400					F_1 S_2
	M		454				1320					F_1 S_2
	M		450				1600					F_1 S_2
	M		448				1420					F_1 S_2
	M		444				1290					F_1 S_2
	M		435				1250					F_1 S_2
3	F	565	530	132	35	42	2230	67	3940	3.1	80	F_1 S_2
	F	527	496	151	31	42	2370	49	3640	3.0	108	F_2 S_2
	F	517	486	127	32	38	1720	45	3210	3.0	87	F_1 S_2
	F	478	450	118	26	36	1340	7	5640	1.4	108	F_1 S_2
	F	476	446	105	26	35	1210	7	7970	1.2	103	F_1 S_2
	F	473	442	125	26	34	1320	9	6040	1.5	94	F_1 S_2
	F	471	442	112	25	35	1230	7			83	F_2 S_2
	F	469	442	110	25	35	1260	9	7190	1.3		F_2 S_2

Table 43. (Continued)

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age
3	F	465	436	110	24	36	1200	9	7650	1.2	—	
	F	457	426	111	24	34	1200	6	6070	1.3	103	F_2 S_2
	M	511	479	128	30	38	1740	1			109	F_2 S_2
	M	477	446	110	27	34	1270	4			92	F_2 S_1
	M	463	438	113	25	36	1210	3			99	F_2 S_2
	M	537	507	129	31	38	1800				82	F_2 S_1
	M	526	497	127	31	36	1760				78	F_2 S_1
	M	515	480	128	29	38	1700				89	F_2 S_2
	M	484	455	112	28	34	1320				93	F_3 S_1
	M	474	445	113		33	1320				99	F_2 S_1
4	F	551	519	140	31	40	2110	19	7350	1.5	120	
	F	504	473	120	28	36	1590	7	4340	1.4	72	F_2 S_2
	F	483	457	111	24	34	1300	9	3710	1.5	93	F_2 S_2
	F	480	454	115	26	35	1350	8	6490	1.1		F_1 S_2
	F	457	430	116	22	35	1250	9	7740	1.3	102	F_2 S_2
	F	452	426	106	27	32	1100	6	5650	1.2	102	F_1 S_2
	F	412	389	100	23	32	850	4	4100	1.1	94	F_1 S_2
	F	488	460	120	31	36	1500				91	F_2 S_2
	M	600	565	147	40	41	2870	20			75	F_1 S_3
	M	525	495	135	33	40	1800	4			95	F_1 S_2
	M	504	472	125	29	36	1530	3			108	F_1 S_3
	M	466	438	117	30	34	1270	2			90	F_1 S_2
	M	554	520	145	39	40	2190				98	F_1 S_2
	M	493	464	124	27	34	1470				91	F_1 S_2
	M	492	465	112	36	36	1350				93	F_2 S_2
	M	490	465	117	27	34	1360				96	F_1 S_2
	M	481	455	115	27	34	1240				99	
	M	474	444	118	24	37	1350				92	F_2 S_2

Table 43. (Continued)

3. Chum salmon, シロザケ

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age	S.P.
1	F	575	540	152	40	38	2600	188	2800	5.1	181	4	
	F	574	543	147	48	38	2540				137	3	C D
	F	528	502	139	32	36					167		
	M	592	558	157	50	42	2850	143			188	5	A
	M	550	519	141	40	36	2130				209	4	C

Table 43. (Continued)

No. of fishing	Sex	F.L. (mm)	B.L. (mm)	B.H. (mm)	S-E (mm)	C.P.D. (mm)	B.W. (g)	G.W. (g)	E.N.	E.D. (mm)	P.A.N.	Age	S.P.
3	F	526	500	128	36	38	1900	15	3530	1.9	214	4	
	F	522	496	133	32	36	1820	12	4750	1.7	195	4	A
	F	520	494	125	33	34	1720	14	4420	2.0	214	4	A
	F	517	489	130	32	34	1930	11	4320	1.7	187	4	A
	F	507	481	123	28	34	1560	11	3740	1.6	209	4	C
	F	500	469	124	31	35	1540	9	5010	1.8	200	4	C D
	F	492	467	122	28	32	1500	9	3830	1.5	163	3	C D
	F	486	456	125	27	34	1540	10			187	3	A
	F	484	460	124	30	34	1450	12	4860	1.6	163	4	
	F	474	450	116	25	30	1370	6	4430	1.3	193	3	C D
	F	474	450	116	30	32	1300	4	4490	1.2	200	3	A
	F	460	438	114	27	30	1250	6	5760	1.3	168	3	
	F	457	431	112	26	31	1200	4	3530		155	3	A
	F	450	425	113	27	30	1230	6	6120	1.2	218	3	
	F	453	428	108	25	29	1050					3	A
	M	577	545	147	37	41	2550	6			220	5	A
	M	506	482	119	29	32	1500	2			175	4	C
	M	493	466	118	30	33	1520	3			205	4	A
	M	480	450	120	32	33	1420				186	3	
	M	465	438	109	26	29	1050				191	3	A
	M	461	436	110	27	32	1220	2			144	3	A
4	F	568	532	140	36	38	2250	15	3800	2.0	184	5	A
	F	535	502	132	31	36	2840	13		1.9	212	5	A
	F	532	503	133	32	34	1840	16	5510	1.6	181	5	A
	F	506	476	117	32	34	1510	14	5540	1.8	209	4	A
	F	472	450	110	32	32	1210	12	3120	1.9	199		
	F	440	412	101	24	28	1040	4	4720	1.2	143	3	A
	F	362	346	74	21	22	520	2	4130	0.9	168	3	A
	M	572	540	125	40	36	2890	6			156	5	C
	M	570	536	146	37	40	3420	5			176	5	A
	M	564	531	136	33	36	2090	5			202	4	A
	M	558	527	138	35	36	2060	4			206	5	A
	M	547	514	130	36	36		8			158	3	
	M	543	516	127	35	36	1900	7			132	3	B
	M	530	498	130	31	38		2			181	4	A
	M	516	486	122	33	34	1640	1			202	4	
	M	504	476	117	27	34	1500	3			212	4	A
	M	481	454	110	27	32	1250	3			199	3	C
	M	438	411	103	29	29	1030	2			156	3	
	M	426	402	94	26	30	880	1			174	3	A
7	F		468									3	A
	F		411									3	A
	M		520									3	A
			436									3	A
8	F		514									4	A
	F		470									4	A

II. Length distribution of fish body
(体 長 分 布)

Nearly all of the fish caught were subjected to the measurement.

Table 44. Length distribution of salmon in 1956 cruise to the Bering Sea

Species	No. of fishing	Fork length (cm) 35.5	36.5	37.5	38.5	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5
Silver salmon	1														1			1	2
	2																	3	
	3																		
	4																		1
	Total														1			4	3
Sockeye salmon	1									1	3		5	1	1	2		1	
	2						1	1	1		7	9	13	19	19	24	10	2	3
	3												3	2		1	1	2	2
	4							1			1			1	4	2	2		1
	5												1				1		
	Total						1	2	1	1	11	9	22	23	24	29	14	5	6
Chum salmon	1																	1	1
	2															1			1
	3											2	4	3	2	3	1	2	3
	4		1						1	2		1		1		1	2	2	5
	5																		
	7									1			2						
	8																1		
	Total		1						1	3		3	6	4	2	5	4	5	10

Species	No. of fishing	Fork length (cm) 53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5	61.5	62.5	63.5	64.5	65.5	$\bar{x}$	$\Sigma(x-\bar{x})^2$	n
Silver salmon	1	3	3	2	2	2	2	2	4		1		1	1	56.98	427.1	27
	2	1	2	3	1	2	1	1	5	1	3				57.59	295.9	23
	3						1								58.50		1
	4														52.50		1
	Total	4	5	5	3	4	4	3	9	1	4		1	1	57.19	754.9	52
Sockeye salmon	1		1	1	1		3	1	2	1	1				52.10	1004.0	25
	2	8	2	2	1	1			1		2	1			49.12	1770.5	127
	3	1			1										50.19	123.8	13
	4			1											48.88	139.9	13
	5														48.50	8.0	2
	Total	9	3	4	3	1	3	1	3	1	3	1			49.59	3239.6	180
Chum salmon	1		1	1		2		1							55.50	50.0	7
	2														51.00	4.5	2
	3	1				1									49.41	198.0	22
	4	1	3	1	1										50.18	532.6	22
	5	1				1									55.50	8.4	2
	7		1												47.75	66.8	4
	8		1												52.50	8.0	2
	Total	3	6	2	1	4		1							50.63	1157.2	61

III. Length distribution of fish body in each sample caught with different mesh sizes of the net
(網目合別体長分布)

Nearly all of the fish caught were subjected to the measurement.

Table 45. Length distribution of salmon in various mesh size of the net in 1956 cruise to the Bering Sea

Mesh size of the net used (Sun)	Species	Fork length (cm) 35.5	36.5	37.5	38.5	39.5	40.5	41.5	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5	52.5
3.5	Silver salmon																	1	
	Sockeye salmon							1	2	1	9	5	11	9	4	5	2	2	
	Chum salmon		1						1	3		1	2	1			2	1	3
	Total		1					1	3	4	9	6	13	10	4	5	4	4	3
3.8	Sockeye salmon															2	2		
	Chum salmon																		
	Total															2	2		
4.0	Silver salmon																	1	2
	Sockeye salmon							1			2	4	11	14	19	22	10	3	6
	Chum salmon											2	4	3	2	4	2	4	6
	Total							1			2	6	15	17	21	26	12	8	14
4.5	Silver salmon														1			2	1
	Sockeye salmon														1				
	Chum salmon															1			1
	Total														2	1		2	2

Mesh size of the net used (Sun)	Species	Fork length (cm) 53.5	54.5	55.5	56.5	57.5	58.5	59.5	60.5	61.5	62.5	63.5	64.5	65.5	$\bar{x}$	$\Sigma(x-\bar{x})^2$	n
3.5	Silver salmon														51.50		1
	Sockeye salmon	1													46.85	302.5	52
	Chum salmon		2	1											48.33	459.1	18
	Total	1	2	1											47.29	812.8	71
3.8	Sockeye salmon	2		1	2		3		2	1	1				56.00	290.0	16
	Chum salmon				1										56.50		1
	Total	2		1	3		3		2	1	1				56.03	291.0	17
4.0	Silver salmon	1	3	2	2	1	2	2	6	1	3		1	1	58.32	389.5	28
	Sockeye salmon	5	3	2	1			1							49.35	803.1	104
	Chum salmon	3	4	1		3									51.13	431.1	38
	Total	9	10	5	3	4	2	3	6	1	3		1	1	51.22	3396.5	170
4.5	Silver salmon	3	2	3	1	3	2	1	3		1				56.07	267.7	23
	Sockeye salmon	1		1		1			1		2	1			58.00	194.0	8
	Chum salmon					1		1							54.75	62.8	4
	Total	4	2	4	1	5	2	2	4		3	1			56.36	558.9	35

(1 Sun = 1.19 cm)

17. Data on Stomach Contents of Salmon
(鮭鱒胃内容物記録)

See notes in IV, 18 (p. 127).

Sampling of stomachs was made by M. Ueno, K. Kobayashi, K Kyushin, etc. Measurement was made by S. Motoda, T. Kawamura, M. Anraku, T. Minoda, etc.

Table 46. Data on stomach contents of salmon in 1956 cruise to the Bering Sea

No. of fishing	Fish from which stomachs were sampled				Stomach contents (gr) (parentheses mean individual number)										
	Species	Sex	Scaled body length (cm)	Body weight (gr)	Digestibility	Adult or young fish	Fish-larva	Squid	Squid-larva	Copepod	Euphausiid	Amphipod	other groups	Unidentified fragments and mucus	Total
1	Silver salmon (ギンザケ)	♀	52.2	2280	C			61.3 3)							61.3
	〃	〃	57.0	3300	A									5.7	5.7
	〃	〃	56.5	3320	A									34.8	34.8
	〃	〃	50.6	2280	C			34.2(1)						1.2	35.4
	〃	〃	54.4	2900	C			146.3(8)							146.3
	〃	〃	55.8	3240	A									1.1	1.1
	〃	〃	57.1	2980	A									0.3	0.3
	〃	♂	60.4	3480	C			95.9(5)							95.9
	〃	〃	55.2	2700	B			16.5						1.5	18.0
	〃	〃	56.4	3240	C			64.7(2)							64.7
	〃	〃	56.6	3490	C			76.6(4)							76.6
	Sock-eye salmon (ベニザケ)	♀	41.7	920	A									0.2	0.2
	〃	〃	41.6	1000	A									0.2	0.2
	〃	〃	41.1	920	A									2.7	2.7
	〃	〃	46.7	1500	C			14.7(3)							14.7
	〃	〃	42.9	1100	A			2.2						2.1	2.1
	〃	〃	57.1	2950	B										2.2
	〃	♂	43.0	1150	B			4.7							4.7
	〃	〃	48.6	1600	C			15.3 1)						0.5	15.8
	〃	〃	46.7	1450	A									0.5	0.5
	Chum salmon (シロザケ)	♀	50.2	——	B							5.3	0.1	0.3	
	〃	〃	54.3	2540	A									0.3	0.3
	〃	〃	48.2	1850	C			11.0(1)							11.0

Table 43. (Continued)

No. of fishing	Fish from which stomachs were sampled				Stomach contents (gr) (parentheses mean individual number)										
	Species	Sex	Scaled body length (cm)	Body weight (gr)	Digestibility	Adult or young fish	Fish-larva	Squid	Squid-larva	Copepod	Euphausiid	Amphipod	other groups	Unidentified fragments and mucus	Total
	Chum salmon (シロザケ)	♀	54.0	2600	A									2.1	2.1
	〃	♂	51.9	2130	A									10.5	10.5
	〃	〃	55.8	2850	A									3.2	3.2
	〃	〃	50.5	2320	C			61.8(3)							61.8
2	Silver salmon (ギンザケ)	♀	53.4	2820	A									0.3	0.3
	〃	〃	52.2	2620	A									0.4	0.4
	〃	〃	56.5	3050	A									0.1	0.1
	〃	〃	57.0	2420	A									0.1	0.1
	〃	〃	54.4	2900	A									0.5	0.5
	〃	〃	58.9	3180	A									0.2	0.2
	〃	♂	51.4	2280	B			0.5							0.5
	〃	〃	58.7	4050	B			0.6							0.6
	〃	〃	50.6	2050	Empty										0.
	Sock-eye salmon (ベニザケ)	♀	42.0	1050	B							3.5			3.5
	〃	〃	43.6	1240	B					0.2					0.2
	〃	〃	43.3	1180	B							0.9		0.3	1.2
	〃	〃	46.6	1420	B							3.5			3.5
	〃	〃	42.6	1200	A									1.2	1.2
	〃	〃	46.1	1450	A									0.9	0.9
	〃	〃	46.2	1440	A									1.4	1.4
	〃	♂	49.5	1880	C		1.8					0.7		0.4	2.9
	〃	〃	57.4	1670	B							0.8			0.8
	〃	〃	50.0	2100	B						0.6	2.1			2.7
	〃	〃	44.3	1230	B							5.7			5.7
	〃	〃	52.7	2260	A									0.3	0.3
	〃	〃	50.7	2050	Empty										0.
	〃	〃	44.6	1350	B							3.0		1.7	4.7
	〃	〃	49.0	1450	B							2.5			2.5
	〃	〃	47.0	1610	B							1.2			1.2
	〃	〃	50.6	1940	A									0.8	0.8
	〃	〃	57.4	1470	B							2.9			2.9
	〃	〃	46.5	1290	B						1.0	2.1			3.1
	〃	〃	48.0	1720	A									1.3	1.3

Table 43. (Continued)

No. of fishing	Fish from which stomachs were sampled: Species	Sex	Scaled body length (cm)	Body weight (gr)	Digestibility	Adult or young fish	Stomach contents (gr) (parentheses mean individual number): Fish-larva	Squid	Squid-larva	Copepod	Euphausiid	Amphipod	other groups	Unidentified fragments and mucus	Total
3	Sock-eye salmon (ベニザケ)	♀	45.0	1340	A									9.1	9.1
	〃	〃	44.6	1210	B							1.1		1.1	2.2
	〃	〃	43.6	1200	B		0.8								0.8
	〃	〃	42.6	1200	B		2.2					3.0			5.2
	〃	〃	48.6	1720	C		1.3					1.0			4.3
	〃	〃	49.6	2370	B							5.9		15.5	21.4
	〃	〃	44.2	1320	C		15.9					6.8			22.7
	〃	〃	44.2	2230	B						0.7	0.4		0.7	1.8
	〃	〃	44.2	1260	B							7.7			7.7
	〃	〃	53.0	2230	A										0.2
	〃	♂	50.7	1800	C		11.2					5.3			16.5
	〃	〃	48.0	1700	B		0.4								0.4
	〃	〃	47.9	1740	B							2.0			2.0
	〃	〃	44.5	1300	B							0.1	0.2	0.5	0.8
	〃	〃	44.6	1270	C		2.0					3.0			5.2
	〃	〃	45.5	1320	C		15.0					1.8	0.3		17.1
	〃	〃	43.8	1210	B		11.6					1.1			12.7
	〃	〃	49.7	1760	B							6.5		1.9	8.4
	Chum salmon (シロザケ)	♀	46.7	1500	A									3.8	3.8
	〃	〃	43.1	1200	B							0.8			0.8
	〃	〃	45.6	1540	B						2.4			0.4	8.4
	〃	〃	42.8	1050	A									9.8	9.8
	〃	〃	49.6	1820	A									6.1	6.1
	〃	〃	46.9	1540	B					1.0		3.0			4.0
	〃	〃	45.0	1300	A									16.4	16.4
	〃	〃	50.0	1900	A									0.2	0.2
	〃	〃	49.4	1720	A									3.3	3.3
	〃	〃	48.1	1560	A									5.3	5.3
	〃	〃	45.0	1340	A									16.6	16.6
	〃	〃	42.5	1230	C		5.4					2.6		1.4	9.4
	〃	〃	46.0	1450	A									9.3	9.3
	〃	〃	43.8	1250	A									8.1	8.1
	〃	♂	48.2	1500	B		9.8							0.5	10.3
	〃	〃	54.5	2550	A									18.1	18.1
	〃	〃	43.6	1220	A									7.2	7.2
	〃	〃	43.8	1050	B							7.5		1.2	8.7
	〃	〃	46.6	1520	A									4.0	4.0
	〃	〃	45.0	1420	A									2.1	2.1

Table 43. (Continued)

No. of fishing	Fish from which stomachs were sampled				Stomach contents (gr) (parentheses mean individual numter)										
	Species	Sex	Scaled body length (cm)	Body weight (gr)	Digestibility	Adult or young fish	Fish-larva	Squid	Squid-larva	Copepod	Euphausiid	Amphipod	other groups	Unidentified fragments and mucus	Total
4	Sock-eye salmon (ベニザケ)	♀	45.7	1300	B							6.4			6.4
	〃	〃	47.3	1590	A									0.3	0.3
	〃	〃	45.4	1350	C					1.1		1.7			2.8
	〃	〃	46.0	1500	B						0.5	1.7		0.2	2.4
	〃	〃	38.9	850	B			1.1							1.1
	〃	〃	42.6	1100	B							6.8		0.8	6.8
	〃	〃	43.0	1250	B							1.3			1.3
	〃	〃	51.9	2110	B							0.8			0.8
	〃	♂	49.5	1800	B						0.2				0.2
	〃	〃	44.4	1350	A										0.8
	〃	〃	46.4	1470	B						7.2				7.2
	〃	〃	52.0	2190	B						11.3				11.3
	〃	〃	47.2	1530	B						11.0				11.0
	〃	〃	45.5	1240	B							3.5			3.5
	〃	〃	56.5	2870	B						29.6				29.6
	〃	〃	46.5	1360	A									0.5	0.5
	〃	〃	43.8	1270	B						0.7				0.7
	Chum salmon (シロザケ)	♀	50.2	2840	A									11.9	11.9
	〃	〃	47.6	1510	B						0.4			3.8	4.2
	〃	〃	53.2	2250	A									10.8	10.8
	〃	〃	54.0	1890	B				0.5					0.8	1.3
	〃	〃	45.0	1210	A									3.0	3.0
	〃	〃	50.3	1840	A									3.5	3.5
	〃	〃	34.6	520	B						1.1			2.1	3.2
	〃	♂	47.6	1500	A									3.3	3.3
	〃	〃	41.1	1030	B							6.9			6.9
	〃	〃	49.8	2830	A									1.2	1.2
	〃	〃	41.2	1040	B							3.6		0.8	4.4
	〃	〃	40.2	880	A									0.3	0.3
	〃	〃	51.6	1900	B				0.7		0.2	3.2			4.1
	〃	〃	53.1	2090	A									12.8	12.8
	〃	〃	52.7	3420	A									20.2	20.2
	〃	〃	53.6	3420	B	1.8(1)								1.6	3.4
	〃	〃	48.6	1640	A									3.2	3.2
	〃	〃	50.4	2970	B							18.1			18.1

18. Data on Trawl Fishing
(トロール試験記録)

122 Shaku (40 metres) of head rope were employed. (ヘツドロープ122尺)
Otter board was set close to the wing of the net, without hand rope. (オツターボードは袖網に直結)
Operation was supervised by I. Saito, T. Fujii (captain) and deck officers.
Records of fish species and measnerement of their weight were made by M. Ueno, K. Kyushin and M. Oseko.

I. List of fishes and invertebrates caught by trawling
(漁獲された魚種)

Limanda aspera (Pallas), Yellow-fin sole, ロスケガレイ
Lepidopsetta bilineata (Ayres), Rock sole, シユムシユガレイ
Pleuronectes pallasii Steindachner, ツノガレイ
Platichthys stellatus (Pallas), Starry flounder, タカノハガレイ
Atheresthes stomias (Jordan & Gilbert), アラスカアブラガレイ
Hippoglossus stenolepis Schmidt, Halibut, オヒヨウ
Hippoglossoides elassodon Jordan & Gilbert Flat-head sole, ウマガレイ
Reinhardtius hippoglossoides (Walbaum), エゾカラスガレイ
Gadus macrocephalus Tilesius, Alaska cod, マダラ
Theragra chalcogramma (Pallas), Alaska pollack, スケトウダラ
Eleginus gracilis (Tilesius), Northern cod, コマイ
Mallotus catervaeius (Pennant), カラフトシシヤモ
Clupea pallasii Cuvier & Valenciennes, Herring, ニシン
Osmerus dentex Steindachner, Frost fish, Rainbow herring, Smelt, キウリウオ
Breviraja parmifera (Bean), Skate, ツノカスベ
Sculpin, カジカ類
Eel pout, ゲンゲ類
Rock sucker, クサウオ類
Chinoecetes opilio O. Fabricius, ズワイガニ
Paralithodes camtschatica Tilesius, King crab, タラバガニ
Hyas coarctatus altaceus Brandt, ヒキガニ
Erimacrus isenbeckii Brandt, ケガニ
Shrimp, エビ類
Sea squirt, ホヤ類
Starfish, ヒトデ類
Sea cucumber, ナマコ類
Gorgonocephalus caryi Lyman, オキノテズルモズル
Sea snail, 巻貝類
Bivalve, 二枚貝類
Sea anemone, イソギンチヤク類
Sand saucer, スナジヤワン

II. Data on fishing operation
(操 業 記 錄)

Table 47. Data on trawling in 1956 cruise to the Bering Sea

No. of fishing	Date and time of net cast	Duration of net haul (Hour)	Position		Depth of sea bottom (m)	Quality of bottom	Temperature near sea bottom (C°)	Weather	Air temperature (C°)	Wind direction	Wind force
			Net cast	Net haul							
1	Aug. 5 9h–00m	1.0	Lat. 62°–42′ N Long 174°–22′ W	62°–43.7′ N 174°–19.5′ W	70	Green mud	–1.69	Foggy	8.2	S W	3
2	Aug. 5 16h–00m	1.5	63°–00′ N 172°–54′ W	63°–00′ N 172°–45′ W	70	Green mud	–1.60	Rainy	8.0	S S W	3
3	Aug. 6 17h–00m	1.5	61°–26′ N 168°–58′ W	61°–22′ N 168°–50′ W	38	Sandy mud	6.05	Drizzling Rain	7.9	S W	4
4	Aug. 6 19h–30m	2.0	61°–22′ N 168°–50′ W	61°–30′ N 168°–34.5′ W	36	Sandy mud		Foggy	8.0	S W	3
5	Aug. 7 7h–30m	1.5	60°–20′ N 169°–00′ W	60°–17′ N 168°–47.5′ W	40	Sandy mud	5.64	Foggy	7.0	S W	1
6	Aug. 7 14h–00m	2.0	60°–55.5′ N 168°–30′ W	60°–56′ N 168°–27′ W	38	Small sand	6.48	Cloudy	8.7	N N E	1
7	Aug. 7 18h–30m	2.0	61°–09′ N 168°–25′ W	61°–13′ N 168°–22′ W	36	Small sand	7.15	Foggy	8.2	N E	1
8	Aug. 8 10h–25m	2.0	59°–24′ N 169°–13′ W	59°–33′ N 169°–17′ W	51	Small sand	3.57	Foggy	10.0	N W	1
9	Aug. 8 15h–40m	2.5	59°–24′ N 169°–33′ W	59°–22′ N 169°–19′ W	59	Muddy sand	2.89	Fine cloudy	8.9	N W	2
10	Aug. 8 18h–45m	2.0	59°–22′ N 169°–19′ W	59°–31′ N 169°–10′ W	58	Muddy sand		Foggy	8.8		0
11	Aug. 9 6h–00m	2.0	58°–29.7′ N 170°–40.5′ W	58°–31′ N 170°–28′ W	79	Green mud	–0.44	Foggy	8.0	W S W	1

Table 47. (Contiuued)

No. of fishing	Date and time of net cast	Duration of net haul (Hour)	Position		Depth of sea bottom (m)	Quality of bottom	Temperature near sea bottom (C°)	Weather	Air temperature (C°)	Wind direction	Wind force
			Net cast	Net haul							
12	Aug. 9 11h–00m	2.0	58°–31′ N 170°–28′ W	58°–33.2′ N 170°–26.8′ W	83	Green mud	–0.01	Fine cloudy	9.3	S S W	1
13	Aug. 9 14h–15m	1.5	58°–33.2′ N 170°–26.8′ W	58°–36′ N 170°–2.8′ W	83	Green mud	0.07	Foggy	10.0	S S E	3
14	Aug. 9 16h–30m	2.0	58°–36′ N 170°–2.8′ W	58°–41.3′ N 170°–14.0′ W	83	Muddy sand		Foggy	8.0	S	2
15	Aug. 10 6h–30m	2.0	58°–7.8′ N 170°–53.7′ W	58°–12′ N 170°–42′ W	94		0.34	Foggy	8.0	S	4
16	Aug. 10 12h–40m	2.0	58°–19′ N 169°–52′ W	58°–23.8 N 169°–44′ W	76	Muddy sand	10.8	Foggy	9.0	S S W	4
17	Aug. 10 15h–20m	2.0	58°–23.8′ N 169°–44′ W	58°–30′ N 169°–33′ W	76			Foggy	9.1	S	4
18	Aug. 10 18h–00m	1⅔	58°–30′ N 169°–33′ W	58°–33′ N 169°–28.5′ W	78	Muddy sand		Foggy	8.5	S	4
19	Aug. 11 13h–10m	2.0	57°–30′ N 171°–49.5′ W	57°–30′ N 171°–49.5′ W	123	Muddy sand	2.82	Foggy	10.2	S W	3
20	Aug. 11 16h–00m	2.0	57°–30′ N 171°–49.5′ W	57°–32′ N 171°–41′ W	121			Foggy	9.8	S S W	3

Ⅲ. Data on catches
(漁獲記録)

Table 48. Data on catches by trawling

No. of fishing	Catch in weight per haul (Kan) (1 Kan = 3.75kg)				
	Limanda aspera (PALLAS) (ロスケガレイ)	Lepidopsetta bilineata(AYRES) (シュムシュガレイ)	Pleuronectes pallasil STEINDACHNER (ツノガレイ)	Hippoglossus stenolepis SCHMIDT (オヒョウ)	Eleginus gracil s (TILESIUS) (コマイ)
1					
2					
3	93.8		Few	5.3	2.9
4	30.2		Few	5.2	125.8
5	12.5	1.3	0.4	2.0	2.9
6	10.3	0.3		9.6	6.2
7	5.1		0.7	4.7	13.7
8	9.4	4.5	9.4	1.5	0.5
9	33.5	3.7	24.6	0.4	0.5

in 1956 cruise to the Bering Sea

Sculpin (カジカ類)	Total	Remarks
		2 Hippoglossoides elassodon JORAN & GILBERT(ウマガレイ), 1 Rein hardtius hippoglossoides (WALBAUM) (エゾカラスガレイ), Two species of sea snail(巻貝), 2 Chionoecetes opilio O. FABRICIUS(ズワイガニ), Sea cucumber (ナマコ類), Starfish(ヒトデ類), shrimp(エビ類), Sea anemone(イソギンチャク類), Sea squirt(ホヤ類), Gorgonocephalus cargi LYMAN (オキノテズルモズル).
Few		10 Hippoglossoides elassodon JORAN & GILBERT. 2 Reinhardtius hippoglossoides(WALBAUM), 4 Theragra chalcogramma(PALLAS), Pock sucker (クサウオ類), Mallotus catervarius(PENNANT)カラフトシシャモ, Eel Pout (ゲンゲ類), Chionoecetes opilio O. FABRICIUS, Shrimp, Starfish, Sea snail, Sea squirt, Sea cucumber.
Few	102.0	2 Platichthys stellatus (PALLAS) (タカノハヌマガレイ), Osmerus dentex STEINDACHNER (キュウリウオ), Sea squirt, Starfish.
Few	161.2	8 Platichthys stellatus (PALLAS), 3 Clupea pallasii CUVIER & VALENCENNES (ニシン), 1 Paralithodes camtschatica TILESIUS (タラバガニ), Starfish, Sea snail, Sea squirt.
Few	19.1	1 Gadus macrocephalus TILESIUS (マダラ), 1 Breviraja parmifera (BEAN) (ツノカスベ), 2 Clupea pallasii CUVIER & VALENCENNES, 1 Paralithodes camtschatica TILESIUS, Erimacrus isenbeckii BRANDT (ケガニ), Starfish, Sea squirt.
Few	26.4	Osmerus dentex STEINDACHNER, Clupea pallasii CUVIER & VALENCENNES. Crab, Gadus macrocephalus TILESIUS, Theragra chalcogramma (PALLAS) (スケトウダラ), Starfish, Sea squirt.
Few	24.2	Osmerus dentex STEINDACHNER, Platichthys stellatus (PALLAS), Chum Salmon, Clupea pallasii CUVIER & VALENCENNES, Erimacrus isenbeckii BRANDT, Srarfish, Sea squirt.
18.8	44.1	Gadus macrocephalus TILESIUS, Breviraja parmifera (BEAN), Mallotus catervarius (PENNANT), Starfish (very abundant), Sea squirt.
47.4	110.1	2 Breviraja parmifera (BEAN), 1 Gadus macrocephalus TILESIUS, Chionoecetes opilio O. FABRICIUS, Sea smail, Starfish, Sea squirt.

Table 48. (Continued)

No. of fishing	Catch in weight per haul (Kan) (1 Kan = 3.75kg)				
	Limanda aspera (PALLAS) (ロスケガレイ)	Lepidopsetta bilineata(AYRES) (シュムシュガレイ)	Pleuronectes pallasil STEINDACHNER (ツノガレイ)	Hippoglossus stenolepis SCHMIDT (オヒョウ)	Eleginus gracilis (TILESIUS) (コマイ)
10	27.3	7.4	19.2	0.2	0.3
11	206.9		17.5		
12	403.8		Few	0.2	
13	105.4	9.4	Few	0.3	
14	53.7	6.3	21.6		
15	34.1	5.1	8.4		
16	53.9	4.5	3.1	0.3	
17	71.2	28.8	10.7	1.3	
18	44.1	7.7	9.5		
19					
20					
Total	1,195.2	83.9	125.1	31.0	152.8
Per cent	69.2	4.9	7.2	1.8	8.8

Sculpin (カジカ類)	Total	Remarks
29.7	84.1	Reinhardtius hippoglossoides (WALBAUM), Erimacrus isenbeckii BRANDT, Sea snail, Starfish, Sea squirt.
Few	224.4	Eel pout, Reinhardtius hippoglossoides (WALBAUM), Pock sucker, Sea snail, Starfish, Sea squirt.
Few	404.0	1 Gadus macrocephalus TILESIUS, Reinhardtius hippoglossoides (WALBAUM), Eel pout, Chionoecetes opilio O. FABRICIUS (Veryabundant), Starfish (abundant). Sea snail, Sea squirt.
	115.1	1 Theragra chalcogramma (PALLAS), Eel pout, Sea snail. Sea squirt, Starfish.
	81.6	2 Breviraja parmifera (BEAN), 4 Gadus macrocephalus TILESIUS, Chionoecetes opilio O. FABRICIUS (abundant), Starfish (abundant), Sea squirt, Sea snail.
Few	47.6	Reinhardtius hippoglossoides (WALBAUM), Theragra chalcogramma (PALLAS), Chionoecetes opilio O. FABRICIUS, Shrimp, Starfish, (abundant), Sea squirt, Sea snail.
19.7	81.5	3 Breuiraja parmifera (BEAN), 1 Gadus macrocephalus TILESIUS, Theragra chalcogramma (PALLAS), Chionoecetes opilio O. FABRICIUS, Starfish, Sea squirt, Sea snail.
19.7	131.7	Reinhardtius hippoglossoides (WALBAUM), 3 Gadus macrocephalus TILESIUS, Chionoecetes opilio O. FABRICIUS. Starfish, Sea squirt, Sea snail.
5.2	66.5	4 Breviraja parmifera (BEAN), 1 Gadus macrocephalus TILESIUS, Starfish, Sea squirt, Sea snail.
		Operation failing (net entangled). (操業失敗)
Few	4.9	Reinhardtius hippoglossoides (WALBAUM), Atheresthes stomias (JOROAN & GILBERT) (アラスカアブラガレイ), Gadus macrocephalus TILESIUS, Eel pout, Starfish, Theragra chalcogramma (PALLAS), Breviraja parmifera (BEAN), Sea snail, Shrimp (abundant), Chionoecetes opilio O. FABRICIUS (very abundant).
140.5	1,728.5	
8.1	100	

19. Data on Measurement of Biological Characters on Trawl Caught Fishes

（トロール漁獲魚の生物学的測定記録）

Measurement was made by M. Ueno, K. Kyushin, T. Kinoshita, M. Oseko. and T. Sasaki.

I. Measurement of various biological characters

（各種生物学的形質測定）

Abbreviations:

Sex,	F.	Female
	M.	Male
T. L.		Total length
H. L.		Head length
B. W.		Body weight
V. N.		Vertebral number excluding urostyle

Table 49. Data on measurement of trawl-caught fishes in 1956 cruise to the Bering Sea

1. *Limanda aspera* (Pallas), Yellow-fin sole, ロスケガレイ

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
3	F	422	91	930	40
	F	378	80	630	39
	F	367	79	540	39
	F	360	74	520	40
	F	342	72	390	40
	F	330	67	410	39
	F	304	66	340	39
	F	252	51	150	40
	M	404	88	900	39
	M	402	82	740	39
	M	400	83	670	38
	M	397	85	690	39
	M	395	87	710	39
	M	391	85	610	39
	M	386	86	650	40
	M	385	86	680	40
	M	378	83	720	39
	M	376	82	620	39
	M	371	84	680	39
	M	366	82	640	39
	M	358	78	560	39
	M	326	65	360	40

Table 49. (Continued)

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
	M	302	64	320	40
	M	300	65	340	39
	M	300	62	280	40
	M	292	56	280	39
	M	230	47	135	39
	M	210	42	110	40
	M	198	40	72	40
	—	431	100	995	—
	—	378	88	650	—
5	F	436	99	900	40
	F	412	93	790	39
	F	408	83	750	39
	F	390	90	800	39
	F	376	83	550	40
	F	196	42	85	39
	F	176	38	55	39
	F	170	35	48	40
	F	167	35	48	40
	F	166	33	48	40
	M	392	97	670	39
	M	391	87	650	39
	M	382	81	610	39
	M	374	82	610	39
	M	372	82	670	39
	M	370	84	530	40
	M	346	74	400	—
	M	344	75	440	40
	M	321	62	280	40
	M	290	65	270	39
	M	215	47	110	40
	M	182	39	63	38
	M	182	34	45	40
	M	170	36	50	39
	M	165	34	43	40
	M	159	35	52	39
	M	150	30	37	40
	M	141	29	28	39
	—	150	30	29	40
	—	134	28	25	39

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
6	F	452	98	1,100	40
	F	417	91	830	40
	F	372	82	550	39
	F	303	66	340	40
	F	189	41	78	39
	F	147	31	25	40
	M	368	80	600	40
	M	362	73	470	40
	M	355	81	490	40
	M	354	75	440	39
	M	344	74	530	40
	M	338	75	480	39
	M	330	70	400	40
	M	322	66	340	40
	M	320	67	330	39
	M	317	67	360	39
	M	292	64	330	40
	M	236	49	94	—
	M	224	46	98	39
	M	205	40	85	38
	M	202	47	84	39
	M	192	40	80	39
	M	180	36	59	39
	M	168	34	47	39
	M	157	33	38	40
	M	155	34	43	39
	M	—	—	59	39
	—	207	42	95	39
	—	134	27	23	39
8	F	334	75	360	39
	F	273	58	210	39
	F	230	47	130	40
	F	200	42	90	40
	F	190	40	85	40
	F	186	40	70	39
	F	178	36	60	39
	F	178	38	65	39
	F	175	36	60	40
	F	162	34	50	39

Table 49. (Continued)

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
	M	360	90	580	37
	M	353	74	430	40
	M	335	69	400	40
	M	312	72	370	39
	M	246	56	200	42
	M	214	44	140	39
	M	208	41	140	40
	M	203	42	140	39
	M	203	37	70	39
	M	200	40	85	40
	M	198	39	85	39
	M	192	40	80	39
	M	190	39	70	39
	M	190	39	75	39
	M	183	37	68	39
	M	182	40	65	39
	M	170	33	45	39
10	F	221	44	120	40
	F	210	44	110	39
	F	200	43	85	40
	F	196	37	61	41
	F	193	40	84	39
	F	185	39	79	39
	F	180	39	59	38
	F	177	37	55	39
	F	172	36	54	39
	F	165	33	46	40
	M	379	83	690	40
	M	333	71	390	40
	M	297	63	280	39
	M	297	—	270	40
	M	295	61	270	40
	M	293	68	280	40
	M	282	59	250	40
	M	265	53	210	39
	M	220	44	110	41
	M	207	41	120	39
	M	198	41	86	39
	M	198	40	90	39
	M	196	41	82	39
	M	194	39	75	39
	M	189	36	68	40
	M	183	38	65	40
	M	180	36	65	39
	M	179	34	51	41
	M	174	38	61	38
	M	170	36	59	39
11	F	418	94	870	39
	F	398	91	740	39
	F	386	88	750	38
	F	370	80	640	39
	F	360	81	480	39
	F	342	69	400	40
	F	330	70	400	39
	F	318	65	340	39
	F	312	63	340	40
	F	310	67	370	40
	F	305	65	340	39
	F	292	60	310	39
	F	292	61	290	38
	F	290	60	310	39
	F	280	60	290	39
	F	272	53	220	39
	F	268	55	240	40
	F	263	52	220	41
	F	245	52	200	40
	F	237	49	185	40
	F	227	46	170	39
	M	318	64	390	38
	M	288	54	290	40
	M	282	61	290	38
	M	278	56	260	40
	M	265	51	240	40
	M	229	47	150	39
	M	228	47	145	38
		286	63	320	—
15	F	416	99	840	38
	F	347	75	540	40
	F	323	65	460	40

Table 49. (Continued)

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
	F	318	69	420	39
	F	314	63	400	40
	F	314	67	390	39
	F	304	65	290	40
	F	300	60	300	39
	F	300	66	370	39
	F	298	60	310	39
	F	293	61	335	38
	F	292	60	335	39
	F	287	57	320	39
	F	280	55	290	38
	F	278	58	240	39
	F	273	54	240	39
	F	270	55	230	39
	F	262	55	260	39
	M	352	72	440	39
	M	278	60	240	40
	M	270	58	265	39
	M	270	52	—	40
	M	270	—	—	39
	M	250	51	190	39
	M	246	50	190	39
	M	224	45	150	39
	M	221	46	140	40
16	F	404	88	690	40
	F	392	79	650	40
	F	390	89	720	40
	F	382	82	700	39
	F	378	81	720	39
	F	370	81	540	40
	F	346	74	450	39
	F	324	67	440	41
	F	322	73	440	38
	F	318	67	410	40
	F	312	67	340	39
	F	308	64	300	40
	F	304	64	305	40
	F	300	63	385	40
	F	292	60	280	39
	F	288	59	310	39
	F	284	56	290	40
	F	270	53	220	40
	F	256	55	240	39
	F	228	46	150	39
	F	218	45	140	40
	F	206	41	110	39
	F	196	41	90	40
	F	194	39	84	39
	M	382	86	630	40
	M	372	80	560	41
	M	368	84	610	38
	M	316	65	405	39
	M	258	53	240	39
	M	208	42	90	39

Table 49. (Continued)

2. *Pleuronectes pallasii* Steindachner, ツノガレイ

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
8	F	378	88	650	41
	F	250	58	240	42
	F	237	56	190	41
	F	230	54	150	41
	F	230	52	160	42
	F	220	55	150	42
	M	345	82	470	41
	M	304	67	300	42
	M	290	65	290	42
	M	260	64	200	41
	M	256	58	200	41
	M	256	57	235	41
	M	250	58	170	41
	M	242	55	190	41
	M	238	52	170	41
	M	227	50	150	42
10	F	454	105	—	42
	F	446	102	980	41
	F	315	71	430	42
	F	272	65	290	41
	F	268	65	265	42
	F	256	57	210	41
	F	248	61	235	41
	F	247	60	190	41
	F	240	55	140	41
	M	358	84	600	41
	M	356	82	550	41
	M	330	78	470	42
	M	320	73	450	42
	M	294	67	320	41
	M	288	63	300	41
	M	287	65	290	41
	M	263	62	270	42
	M	262	61	250	40
	M	256	58	230	41
	M	250	55	200	41
	M	242	53	195	41
	M	242	54	180	39
	M	220	50	150	41

3. *Lepidopsetta bilineata* (Ayres). Rock sole, シュムシュガレイ

No. of fishing	Sex	T.L. (mm)	H.L. (mm)	B.W. (g)	V.N.
8	F	326	80	390	40
	F	284	67	250	40
	F	278	65	240	40
	F	217	52	110	40
	M	284	67	280	39
	M	263	60	230	39
	M	260	59	200	39
	M	175	39	—	39
10	F	300	70	300	39
	F	229	51	120	39
	F	194	44	80	40
	F	190	43	80	40
	F	188	44	50	40
	M	302	69	330	39
	M	280	64	260	39
	M	270	60	240	40
20	F	346	79	540	40
	F	332	80	465	39
	F	332	76	385	40
	F	328	78	400	40
	F	322	76	390	39
	F	300	69	280	40
	F	290	68	310	39
	F	286	66	300	41
	F	286	66	270	—
	F	282	66	250	39
	F	278	62	245	39
	F	278	60	220	39
	F	272	65	240	39
	F	272	64	210	40
	F	268	59	210	40
	F	256	57	180	39
	F	242	49	170	40
	F	232	52	145	39
	M	222	47	110	39
	—	234	51	130	40

II. Frequency distribution of vertebral number
(脊椎骨数分布)

Table 50. Vertebral count of trawl-caught fishes in 1956 cruise to the Bering Sea

Species	Vertebral number								$\bar{x}$	n.
	36	37	38	39	40	41	42	43		
Limanda aspera		1	15	121	84	6	1		39.36	228
Pleuronectes pallasii				1	1	25	12		41.23	39
Lepidopsetta bilineata				18	16	1			39.51	35

III. Relationship between total length and weight (L.-W.), and between head length and total length (H.L.-L.)
(体長と体重及び体長と頭長の関係)

Table 51. Length relationship in trawl-caught fishes in 1956 cruise to the Bering Sea

Abbreviations:

L.	Total length in mm
H. L.	Head length in mm
W.	Weight in gr.

Species	L. - W.	H.L. - L.
Limanda aspera	$W = 0.000016\ L^{3.107}$	$H.L. = 0.232\ L - 5.426$ $(134 < L < 452)$
Pleuronectes pallasii	$W = 0.000310\ L^{2.837}$	$H.L. = 0.230\ L + 0.526$ $(210 < L < 454)$
Lepidopsetta bilineata	$W = 0.000053\ L^{3.318}$	$H.L. = 0.236\ L - 1.840$ $(170 < L < 350)$

Ⅳ. Frequency distribution of body length
(体 長 分 布)

Table 52. Length distribution of trawl-caught

Species	*Limanda aspera*, Yellow-fin sole, ロスケガレイ								*Pleuronectes pallasii*,				
No. of fishing	3 4	5	6 7	8 9 10	11 12 13 14	15	16 17 18	Total	5	6 7	8 9 10	11 12 13 14	15
10.5			1					1					
11.5			3					3					
12.5	5	1	12					18					
13.5	6	5	29	1				41					
14.5	11	4	25	1				41					
15.5	5	3	11	5				24					
16.5	6	7	7	15				35		1			
17.5	7	3	4	30				44					
18.5	4		14	30			5	53					
19.5	3	3	6	36	3		10	61		1			
20.5	5	5	4	18	7		16	55		1			
21.5	1	15	5	13	12	2	15	63		3	1		
22.5	1	11	2	4	12	1	9	40			9		
23.5	3	14	1	1	15	2	5	41		1	6		
24.5	2	10	1	2	24	3	6	48		3	13		
25.5	1	11	1	1	26	3	8	51	1		6		
26.5	2	8		1	39	6	4	60			8		
27.5	6	2	1	5	44	7	8	73			1		
28.5			1	4	35	3	8	51			4		
29.5	3	2	1	5	42	7	14	74			3		
30.5	6	3	2	1	26	2	7	47	1		2	1	
31.5	5	5	5	7	29	4	12	67			2		
32.5	4	3	4	7	20	3	8	49			1		
33.5	6	4	1	5	20	1	4	41	2		1		
34.5			4	5	14	1	12	36	2		2	1	
35.5	5	2	7	2	16		7	39			3	1	
36.5	6	1	3	3	8		9	30			2		
37.5	8	1	2	3	10		11	35			2	1	
38.5	7		3	1	14		16	41				2	
39.5	8	2	1		13		10	34				1	
40.5	2	2			4	1	4	13				2	
41.5	1	1	1		8	1	1	13			1		
42.5	1		2		3		3	9				3	
43.5	2				3		3	8	1		1	1	
44.5	1							1					
45.5			1					1				1	
46.5											1		
47.5												1	1
48.5													
49.5												1	
50.5													1
Total	133	128	165	206	447	47	215	1341	7	10	69	16	2

Class of body length (cm)

fishes in 1956 cruise to the Bering Sea

ツノガレイ		*Lepidopsetta bilineata*, Rock sole, シュムシュガレイ							*Eleginus gracilis*, Northern cod, コマイ			
16 17 18	Total	5	8 9 10	11 12 13 14	15	16 17 18	19 20	Total	3 4	6 7	8 9 10	Total
	1				1			1				
			2		1	1		4				
			1			2		3		1		1
	1		3			3		6		5		5
	1					2		2	1	11		12
	4		1		1	2	2	6	6	17		23
	9		2	1		3		6	11	19		30
	7		1			3	3	7	14	21	1	36
	16			1		3		4	23	28	3	54
	7	1	2		1	2	1	7	23	10	7	40
	8		3	1		4	2	10	23	9	3	35
	1		4	1		3	3	11	12	11	6	29
	4		4	2			1	7	3	2	2	7
	3		4			3	1	8	3		3	6
1	5	1	1	2		2	1	7				
	2					4	1	5			1	1
1	2		1			6	2	9				
2	5	2				2	1	5				
1	6	2				2	1	5				
1	5											
1	3		1					1				
3	6			2	1	3		6				
3	5					2		2				
	1					1		1				
2	4											
	1											
2	5			1	1			2				
	3	1						1				
				1		1		2				
2	3											
	1											
	2			1				1				
1	1											
	1											
	1											
20	124	7	30	13	6	54	19	129	119	134	26	279

20. Data on Fishes Caught by Trawling
（トロール漁獲による魚類記録）

Identification was made by S. Sato and K. Kobayashi.

Family Rajidae

Breviraja parmifera (BEAN) ツノカスベ

Family Clupeidae

Clupea pallasii CUVIER & VALENCIENNES ニシン

Family Salmonidae

Oncorhynchus keta (WALBAUM) サケ, シロサケ

Family Osmeridae

Osmerus dentex STEINDACHNER キュウリウオ
Mallotus catervarius (PENNANT) カラフトシシャモ

Family Zoarcidae

Lycodes raridens TARANETZ & ANDRIASHEV
Lycodes brevipes BEAN アシボソゲンゲ
Lycodes palearis GILBERT ハクセンガジ
Lycodes palearis arcticus TARANETZ & ANDRIASHEV

Family Cottidae

Icelus spiniger intermedius LINDBERG & ANDRIASHEV アイコオリカジカ
Icelus uncinalis GILBERT & BURKE ヒメコオリカジカ
Hemilepidotus hemilepidotus TILESIUS ホンヨコスジカジカ
Myoxocephalus stelleri TILESIUS イサゴカジカ
Myoxocephalus verrucosus (BEAN) イボギスカジカ
Myoxocephalus jaok (CUVIER & VALENCIENNES) オクカジカ
Myoxocephalus polyacanthocephalus (PALLAS) トゲカジカ
Gymnocanthus galeatus BEAN チカメカジカ
Artediellus gomojunovi TARANETZ ヒガシコブカジカ

Family Agonidae

Podothecus acipenserinus (TILESIUS)
Sarritor frenatus GILBERT ヤセテングトクビレ

Family Cyclopteridae

Eumicrotremus orbis orbis (GÜNTHER) イボダンゴ

Family Liparidae

Liparis megacephalus (BURKE)

Careproctus phasma GILBERT

Family Pleuronectidae

Atheresthes stomias (JORDAN & GILBERT) アラスカアブラガレイ
Atheresthes evermanni (JORDAN & STARKS) アブラガレイ
Reinhardtius hippoglossoides (WALBAUM) エゾカラスガレイ
Hippoglossus stenolepis SCHMIDT オヒョウ
Hippoglossoides elassodon JORDAN & GILBERT ウマガレイ, シロガレイ
Hippoglossoides robustus GILL & TOWNSEND ドロガレイ
Lepidopsetta bilineata (AYRES) シュムシュガレイ
Limanda aspera (PALLAS) ロスケガレイ, コガネガレイ
Limanda proboscidea GILBERT ハナガレイ
Pleuronectes pallasii STEINDACHNER ツノガレイ, キガレイ
Platichthys stellatus (PALLAS) ヌマガレイ

Family Gadidae

Gadus macrocephalus TILESIUS マダラ
Eleginus gracilis (TILESIUS) コマイ
Boreogadus saida (LEPECHIN)
Theragra chalcogramma (PALLAS) スケトウダラ

21. Sight Records and Data on Dip-Net Sampling of Saury
（サンマ目視観察及たも網採集記録）

I. Sight records（目視観察記録）

At night densely populated saury shoals, when the ship headed into them, were discernible by fleeing movement of the fish hither and thither in the surface water. Every man on bridge duty at night recorded the presence or absence of saury shoals along the course of the ship. The surface temperature given in the table is the mean for 24 hours based on every-hour measurement.

Table 53. Sight records of saury with records of surface temperature in 1956 cruise to the Bering Sea

Date (1956)	Noon position		Daily mean temp. (°C)	Saury shoals
	Latitude	Longitude		
7-10	Hakodate		14.4	Not observed
11	42-11.0N	145-27.0E	13.7	〃 〃
12	42-57.0N	149-38.0E	13.5	〃 〃
13	Kushiro		11.6	〃 〃
14	42-42.0N	144-21.0E	14.2	〃 〃
15	42-38.0N	148-49.0E	14.0	Caught in sight
16	43-26.0N	153-27.0E	12.2	〃 〃
17	44-24.5N	158-31.0E	11.5	〃 〃
18	45-27.5N	163-40.0E	11.7	〃 〃
19	45-58.0N	168-0.00E	11.2	〃 〃
20	47-05.0N	172-22.0E	11.0	〃 〃
21	48-37.0N	174-51.0E	9.5	Not observed
22	50-19.0N	175-00.0E	8.2	〃 〃
23	52-11.5N	175-04.0E	7.9	〃 〃
24	53-59.0N	175-02.0E	7.6	〃 〃
25	56-01.0N	176-54.0E	8.3	〃 〃
26	54-48.0N	178-21.0W	7.9	〃 〃
27	53-33.0N	178-40.0W	8.2	〃 〃
28	53-04.0N	177-27.0E	8.8	〃 〃
29	51-53.0N	179-58.0E	7.1	〃 〃
30	52-27.0N	178-26.0W	7.8	〃 〃
31	53-58.0N	176-16.0W	9.5	〃 〃
8- 1	56-05.0N	177-00.0W	9.0	〃 〃
2	57-51.0N	178-02.0W	8.8	〃 〃
3	60-30.0N	179-40.0W	8.5	〃 〃
4	61-44.0N	178-33.0W	8.7	〃 〃
5	62-48.0N	173-57.0W	8.7	〃 〃
6	61-53.0N	169-15.0W	8.1	〃 〃
7	60-38.0N	168-37.0W	7.5	〃 〃
8	59-36.0N	169-14.0W	8.1	〃 〃
9	58-32.0N	170-30.0W	8.5	〃 〃
10	58-19.0N	169-55.0W	8.1	〃 〃
11	57-31.0N	171-57.0W	8.8	〃 〃
12	55-30.0N	172-05.0W	10.9	〃 〃
13	52-58.0N	171-57.0W	9.7	〃 〃
14	50-09.0N	171-54.0W	11.9	〃 〃
15	48-00.0N	172-55.0W	13.3	〃 〃
16	47-28.0N	177-32.0W	19.5	〃 〃
17	46-37.5N	177-12.0E	18.7	〃 〃
18	45-29.0N	173-07.0E	19.6	〃 〃

Table 53. (Continued)

Date (1956)	Noon position		Daily mean temp. (°C)	Saury shoals	
	Latitude	Longitude			
19	44-26.0N	169-32.0E	18.2	Not	observed
20	43-07.0N	164-49.0E	19.1	〃	〃
21	43-06.0N	159-51.0E	20.0	〃	〃
22	43-06,0N	154-59.0E	18.3	〃	〃
23	43-20.0N	149-41.0E	16.3	〃	〃
24	42-15.5N	144-42.0E	18.3	〃	〃
25	Muroran		18.6	〃	〃
26	Hakodate		19.1	〃	〃

While many shoals were observed at midnight (00.00-01.00 h) of July 21, 300 miles SSE off Attu Islands where the surface temperature was 10.2 °C, there was no saury at night (21.00-22.00 h) of the same day, 220 miles SSE off Attu Islands, where the surface temperature was lowered to 8.2 °C.e

A remarkable current rip was found directed to the north from 300 miles south off Attu Islands, and this current rip was supposed to form a barrier to distribution of saury in that season.

II. Data on dip-net sampling (たも網採集)

(1) July 20, at night, 46°34′.1N, 170°23′.3E, surface temperature 10.6 °C.
Three specimens were obtained. Each was 26.0 cm, 25.0 cm, 21.5 cm in fork length.

(2) July 21, at midnight, 47°52′N, 174°39′E, surface temperature 10.2 °C.
Many sauries lured by fire were swimming around the ship, and 32 fish were dipped.
Measurement of fork length was made by M. Ueno and K. Kyushin.

Table 54. Length distribution of saury in dip-net sample in 1956 cruise to the Bering Sea

No. of specimens	Fork length (cm)	No. of specimens	Fork length (cm)
1	22.5	17	26.7
2	22.8	18	27.0
3	23.1	19	27.4
4	24.0	20	27.4
5	24.5	21	27.8
6	24.6	22	27.9
7	24.8	23	28.0
8	25.2	24	28.0
9	25.4	25	28.0
10	25.5	26	28.1
11	25.8	27	28.2
12	25.9	28	28.7
13	26.0	29	29.0
14	26.0	30	29.1
15	26.1	31	29.5
16	26.4	32	31.8

22. Sight Records of Whales, etc.
(鯨等目視観察記録)

Table 55. Sight records of whales, etc. in

Date	Hour (ship's)	Position		Weather	Air temp. (°C)	Seasurface temp. (°C)
		Latitude	Longitude			
7-12	0518	42-41N	148-51E	o	11.2	13.4
7-14	1625	42-13N	149-58E	f	14.4	13.7
7-14	1745	42-03N	145-10E	o	15.5	15.2
7-16	1430	43-33N	153-58E	c	12.6	12.6
7-16	1730	43-40N	154-30E	c	12.2	13.4
7-17	1040	44-20N	158-10E	c	11.0	12.3
7-17	1100	44-24N	158-22E	c	11.2	12.5
7-23	1325	52-34N	175-00E	o	10.3	8.3
7-24	1515	54-28N	175-02E	o	7.2	8.0
7-29	0737	52-21N	179-49W	f	8.5	6.0
7-29	0940	52-12N	179-55W	f	6.6	6.2
7-30	1205	52-27N	178-26W	r	9.0	7.8
7-31	1600	54-32N	176-15W	o	9.0	9.4
7-31	1950	54-56N	176-20W	o	7.6	8.9
7-31	2252	55-00N	176-20W	o	7.1	8.7
8- 1	0535	55-08N	176-26W	o	6.2	8.8
8- 1	1030	55-50N	176-55W	o	8.0	9.1
8- 1	1200	55-50N	176-55W	o	9.0	9.3
8- 1	1925	56-46N	177-22W	o	7.5	9.0
8- 2	0735	57-14N	177-34W	o	7.3	8.5
8- 2	0916	57-34N	177-40W	o	8.0	8.7
8- 2	1010	57-40N	177-50W	o	8.0	9.0
8-12	0900	56-10N	172-00W	o	11.0	11.0
8-23	0730	43-06N	150-33E	o	14.5	16.5
8-23	1340	43-16N	149-22E	o	15.0	16.3
8-23	1420	43-15N	149-10E	o	15.0	16.4

* o : Overcast f : Fog c : Cloudy r : Rain

1956 cruise to the Bering Sea

Objects in sight	Observer
5–6 sperm whales	Nishiyama
4–6 sperm whales	Nishiyama
2 sperm whales	Nishiyama
More than 10 sperm whales, dispersed for about 1.5 miles square	Masuda
4 finbacks, slowly swimming toward ENE	Nishiyama
2 sperm whales	Nishiyama
2 sperm whales	Nishiyama
1 large sperm whale, directed W	Masuda
2 finbacks (?), directed SW	Nishiyama
1 fur seal	Kobayashi
6 sea lions	Fujii
1 large sperm whal, directed W	Masuda
2 finbacks (blue whales ?), diving for long duration, directed W	Nishiyama
2 fur seals	Abe
1 fur seal	Kobayashi
1 fur seal	Abe
1 fur seal	Abe
Several fur seals	Saito, S.
2 fur seals	Abe
2 large finbacks (blue whales ?), diving for considerable duration, directed E	Abe
4 finbacks, directed SE	Saito, S.
1 humpback whale, directed W	Saito, S.
Several finbacks, directed S	Saito, S.
Several sperm whales	Abe
More than 10 sperm whales	Masuda
More than 30 sperm whales	Masuda

VI

A NEW SHIP "HOKUSEI MARU Ⅱ"

北星丸代船竣工

(Figs. 5, 6)

A New Ship "Hokusei Maru II"

The National Budget in 1956 fiscal year included an appropriation of ¥ 85,000,000 for construction of a new training ship of the Faculty of Fisheries, Hokkaido University. Accordingly the keel was laid at the Miho Shipyard, Shimidzu, Shidzuoka Prefecture, on October 18, 1956. The vessel was launched on January 21, 1957, and the whole rigging was completed on February 5. The new ship replaces the "Hokusei Maru" (wooden ship 104 gross tons, with Diesel engine, 210 H. P.) which had become old and unsafe, and succeeds to the name of the old one. She is a steel ship rigged for drift-net, long line and stick-held dip-net fishery. For obtaining ease of operation in fishing as well as in various sorts of research work, the mechanism of a controllable pitch propeller is employed. Her particulars are as follows:

練習船北星丸（木船）は老朽使用に耐えざるに至り，昭和31年度8,500万円の予算を以て代船が建造された。新船は静岡県清水市三保造船所に於て昭和31年10月18日起工，32年1月21日進水，2月5日竣工した。同船は鋼船で，流網，延縄，棒受網漁業の装備を有し，可変ピッチプロペラを具えている。船名は旧名を襲いで北星丸と命名された。要目は次の如くである。

Particulars
要　目

PRINCIPAL DIMENSIONS, ETC.（主要寸法其他）

Length overall（全長）		37.00 metres
Length according to the fishing boat regulation（漁船法による長さ）		33.00 metres
Breadth（幅）		6.80 metres
Depth（深さ）		3.40 metres
Gross tonnage（総噸数）		221.61 tons
Net tonnage（純噸数）		95.37 tons
Displacement（排水量）		365 tons
Qualification（資格）		第三種漁船
Maximum speed（最高速力）		11.0 knots
Cruising speed（航海速力）		9.5 knots
Cruising range（航続距離）		9000 miles
Fuel oil tank（燃料油槽）		80.32 cubic metres
Fresh-water tank（清水槽）		27.84 cubic metres
Fish hold（魚槽）		73.00 cubic metres
Number of complement（搭載人員）		43 men
Officers（士官）	8	
Crew（属員）	13	
Cadets（実習生）	20	
Instructors or scientists（指導教官又は調査員）	2	

ENGINE (機関)

Main engine (主機関)	Diesel 450 H. P. Hanshin Nainenki (阪神内燃機) TOV with controllable pitch propeller, Mitsubishi Nihon Juko (三菱日本重工)	1
Auxiliary engine (補機関)	Diesel 65 H. P. Hanshin Nainenki (阪神内燃機) S3G	2
Generator (発電機)	40 K. V. A., A. C. connected with auxiliary engine (交流, 補機直結) Shinko Denki (神鋼電機)	2
Steering engine (操舵機)	Helshow type, oil pressure system, electric, Kawasaki Juko (川崎重工)	1

CUMMINICATION APPARATUS (通信設備)

Main transmitter (主送信機)	250 w, Nihon Musen (日本無線)	1
Emergency transmitter (補助送信機)	75 w, Nihon Musen (日本無線)	1
All wave receiving set (全波受信機)	12 tube double super heterodyne, Nihon Musen (日本無線)	1
Short wave receiving set (短波受信機)	18 tube triple super heterodyne, Nihon Musen (日本無線)	1
Commanding speaker (船内指令装置)	Nihon Musen (日本無線)	1
Cabin telephone (船内電話)	5 circuit, no cell cystem (無電池式5回路)	1
Weather chart facsimile telegraph (気象図模写電送受信装置)	Taiyo Musen (大洋無線)	1

NAVIGATION INSTRUMENTS (航海計器)

Marine radar (船用レーダー)	MR-30, Tokyo Keiki (東京計器)	1
Direction finder (方向探知機)	KS-262 B, Koden Seisakusho (光電製作所)	1
Echo-sounder (音響測深機)	103, Kaijo Denki (海上電機)	1
Magnetic compass pilot (自動操舵装置, 磁気羅針儀連結)	Tokyo Keiki (東京計器)	1
Sal-log (測程機)	Hydraulic pressure system, KGB 2, Hokushin Denki (北辰電機)	1
Sea-scanner	Nihon Denki (日本電気)	1

FISHING GEAR AND REFRIGERATOR (漁業設備及冷凍装置)

Net hauler (揚網機)	Shinomi (四野見)	1
Line hauler (揚縄機)	Idzui (泉井)	1
Hauling winch for stick-held dip-net (棒受網捲上機)	Amemiya Tekko (雨宮鉄工)	1
Fish lamp assembly (集魚灯)	Amemiya Tekko (雨宮鉄工)	1
Fishing boat (漁艇)	5 m long, with Diesel engine 4 H. P.	1
Refrigerating machine (冷凍機)	Fleon compressor, 20 H. P. Sw-V, Mitsubishi Denki (三菱電機)	1

OCEANOGRAPHIC EQUIPMENT (海洋観測設備)

Electromotive winch (電動捲揚機)	1.5 H. P. with 1500 m wire, Tsurumi Seiki (鶴見精機)	1
Hand winch (手動捲揚機)	with 600 m wire	1
Electric resistance thermometer with 200 m cabtyre cord (電気抵抗温度計)	Meiyo Denki (明陽電気)	1